

Harbours review

ISSN 2449-6022

04. Short stories

reads

13. Shipping's climate footprint and the financial industry

- The Poseidon Principles' first report highlights banks' influence on carbon emissions from maritime transport

Ewa Kochańska

17. Will the European Green Deal make ports' future sustainable?

- The road towards climate neutrality is founded on (mostly) regulation

Kai-Dieter Classen and Manfred Lebmeier

20. The biggest logistics project ever

- The challenges of disruption-free vaccine distribution

Michael Yarwood

22. New portscape

- Key takeaways from Deloitte and ESPO's *Europe's Ports at the Crossroads of Transitions*

Przemysław Myszk

32. Trade liberalisation to the post-COVID rescue

- Maritime trade protectionism can stifle economic growth

Ewa Kochańska

37. Trust in software

- Interview with Hans-Christoph Burmeister, Head of the Department Sea Traffic and Nautical Solutions of the Fraunhofer Center for Maritime Logistics and Services

Przemysław Myszk

40. Too good to be true?

- The potential of bioLNG in decarbonising transport

Ewa Kochańska

44. Battle royal

- The decoupling of China, EU, and US economies

Przemysław Myszk

53. editorial

Our Innovation is outside the Box.

Our constant further development only serves the goal of being able to handle your boxes even more efficiently in the future.

liebherr.com

LIEBHERR

Port Equipment
LHM 600



The Port of Opportunities

The Port of HaminaKotka is a versatile Finnish seaport serving trade and industry. The biggest universal port in Finland is an important hub in Europe and in the Baltic Sea region.

Welcome to the Port of HaminaKotka!





short stories

Photo: Pexels

The Tranzero Initiative

The Port of Gothenburg, Stena Line, the Volvo Group, and Scania have teamed up to speed up the transition to fossil-free fuels in the transport sector. Specifically, the parties will target road transportation to and from the Swedish seaport that generates 55kt of carbon emissions per year. The Gothenburg Port Authority's (GPA) aim is to cut the seaport's emissions by 70% by 2030. To that end, GPA will set up the necessary infrastructure to provide heavy-duty vehicles as well as vessels with fossil-free energy sources, such as electric power, hydrotreated vegetable oil, biogas, or hydrogen gas. A market study is being carried out to assess what would work best in the long-run. "No single organisation or individual holds the key to meeting the challenges ahead of us. Collaboration is crucial, and we are pleased to bring

on board two of the world's largest truck manufacturers and the world's largest ferry company. With our collective expertise, breadth, and market presence, we can make a real difference," Elvir Dzanic, Chief Executive, GPA, underlined. According to GPA, "The transition to fossil-free transport to and from the port will need government support for companies that need to upgrade their fleets, for example, designated grants, subsidised charging points, and fossil-free fuels." Dzanic commented in this regard, "We have had a long-standing exchange of views and ideas with the government regarding the challenges we are facing, and our goals are the same. The transport sector needs to move away from its reliance on fossil fuels, and with the Tranzero Initiative, we are taking a monumental step forward."

Corvus Energy-Toyota maritime hydrogen fuel cell co-op

The two have partnered to develop and produce sustainable, large-scale, and modularised Proton Exchange Membrane (PEM) fuel cell systems for the international marine market. The initiative is backed by Equinor, Norled, Wilhelmsen, LMG Marin, NCE Maritime CleanTech, and the University of South-Eastern Norway. The project has also received €5.2m from Innovation Norway. Production will be located in Bergen, with Toyota as the supplier of mass-produced fuel cell technology. The first marine fuel cell system is scheduled for showcasing on-board a vessel in 2023. The product will be marine-certified and available for commercial delivery from 2024. Corvus' new dedicated fuel cell division will design and certify the marine fuel cell system using the Toyota fuel cell technology as a building block for larger systems. Furthermore, a specific marine control system uniting the battery and fuel cell operation will be developed for integration with power management

systems from a range of system integrators. "Adding fuel cell modules to our product portfolio is a natural step for Corvus and advances our vision to be the leading supplier of zero-emission marine solutions. Fuel cell technology has reached a maturity level where scale-up of systems will be the next step. Toyota is in the forefront of the development and is by far the best partner for us to make this a success," Geir Bjørkeli, CEO, Corvus Energy, said. Thiebault Paquet, Director Fuel Cell Business Group, Toyota Motor Europe, added, "Decarbonisation is inevitable, and at Toyota, we are convinced that hydrogen will play a central role in creating a better future, both environmentally and economically. Our recently established Fuel Cell Business group in Brussels is looking forward to working with Corvus Energy and the consortium members to offer fuel cell solutions for marine applications. This project will play an important role in the development of the Hydrogen Society."

Felixstowe to trial 5G, IIoT, and AI

Hutchison Ports' Port of Felixstowe has been selected to take part in the UK Government's 5G Trials and Testbeds Programme. The project will test the potential of 5G across two use cases: enabling remote-controlled cranes via the transmission of CCTV and deploying Industrial Internet of Things (IIoT) sensors and Artificial Intelligence (AI) to optimise the predicative maintenance cycle of Felixstowe's 31 quay- and 82 yard-cranes. Three UK, Cambridge University, Blue Mesh Solutions, Ericsson, and Siemens will assist the Port of Felixstowe in implementing the 3.4m project (which has received 1.6m from the UK Government as part of 5G Create, a competition to support innovators exploring new uses for 5G to improve people's lives and boost

British businesses). "Our ports will be more vital than ever as we forge an ambitious new global trading position for the UK post-Brexit, so I'm eager to see what 5G can do to maximise efficiency at Britain's biggest and busiest container port in Felixstowe," Matt Warman, Minister for Digital Infrastructure, commented. To this, Chris Lewis, CEO, Hutchison Ports UK, added, "We are delighted to be part of this exciting 5G Create programme. Being the largest UK port to introduce 5G technology will allow the Port of Felixstowe to deploy innovative technologies to boost efficiency and improve safety for our workforce. It ties in well with Government policy to create a network of Freeports to act as hotbeds for innovation and to act as hubs for global trade."

The world's first zero-emission tanker to feature Corvus' Orca ESS

Kawasaki Heavy Industries (KHI) has selected the Orca energy storage system (ESS) from Corvus Energy to be installed on-board the all-electric e5 tanker in construction by the Japanese KOA Industry and Imura Shipyard for the also Japanese Asahi Tanker. KHI was awarded the contract for the ship's propulsion system in September 2020 and will integrate the 3,480 kWh Orca ESS to power the vessel. The e5 tanker has been designed by e5 Lab, a consortium of Japanese shipping and maritime services companies (incl. the 137-big-fleet Asahi Tanker) set up to build infrastructure services focused on

electrically-powered vessels. The e5 tanker is the first of two e-vessels to be built from the e5 Lab initiative. She is expected to start her bunkering operations in Tokyo Bay by 2022. The vessel will also make its battery power available to emergency services in the case of a natural disaster in Tokyo. "Like Norway, Japan is a maritime nation with a clear path towards a green future. The government has already announced ambitious plans to be free of carbon emissions by 2050, which will require significant decarbonization initiatives in its world-leading shipping industry," Geir Bjørkeli, CEO, Corvus Energy, commented.

Solid oxide fuel cells for shipping

Alfa Laval, DTU Energy, Haldor Topsøe, Svitzer, and the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping have launched a joint project to accelerate the development of the solid oxide fuel cell (SOFC) technology for marine applications. The SOFC4Maritime project, funded through a grant from the Danish Energy Technology Development and Demonstration Program, will target optimal utilization of future green fuels via application of SOFCs for power production on marine vessels. The research will have ammonia-based SOFCs as its starting point. "By electrochemically converting fuel into electricity, SOFCs can potentially produce power with higher efficiency than internal combustion engines running on the same fuel – without creating polluting emissions or particulates. Ammonia-based SOFCs are especially attractive since ammonia can be produced in large scale using renewable electricity and no biomass resource," the parties said in a press release. Alfa Laval will

head the development initiative. Haldor Topsøe will provide the underlying SOFC stack technology, while DTU Energy will support in system layout and component testing. Svitzer will bring a ship owner perspective, and the Mærsk McKinney Møller Center for Zero Carbon Shipping will ensure a broad industry overview, end-to-end analysis of various energy pathways, and detailed techno-economic analysis. "We are proud to contribute with our competences within SOFC technology and ammonia as a marine fuel in order to reduce carbon emissions from shipping. This is an urgent goal in combatting climate change," Kim Grøn Knudsen, Chief Strategy & Innovation Officer, Haldor Topsøe, commented. To this Bo Cerup-Simonsen, CEO, Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, added, "We are eager to pursue this project, which will provide essential information and enhance the feasibility of future pathways to zero-carbon shipping based on SOFCs."

ABB launches a cybersecurity lab

The company's Marine & Ports division has opened the facility to stress-test cyber threats, soft- and hardware-related, so as to help the shipping industry in adjusting itself to the stricter maritime cybersecurity rules that entered into force on 1 January 2021. The services offered by the ABB Marine & Ports cybersecurity lab include reference architecture that targets network segmentation and segregation; enforcing security policies on zones and conduits; the ability to monitor network traffic and act on vulnerabilities; collection and management of security logs for the control system components; the ABB Ability™ Cyber Asset Inventory solution that discovers and records system inventory as well as notifies about vulnerabilities;

event monitoring that enables sending alerts to crew members; and the ABB Ability™ Collaborative Operations Centers worldwide. "Cybersecurity is not a product but an evolving target which needs constant monitoring, managing and updating," Ahmed Hassan, Head of Cybersecurity, ABB Marine & Ports, underlined. He furthered, "As a single vendor offering operating technology and cybersecurity, we recognize that managing cybersecurity is a careful balance between risk, functionality and cost. The principles of cybersecurity must apply across all maritime stakeholders, from designers and builders to owners, operators and crew; and from classification societies to universities and research bodies, government departments and insurers."

The container barge *Maas* to run on zero-emission hydrogen

Future Proof Shipping (FPS) has partnered with the Holland Shipyards Group (HSG) to retrofit the vessel to a zero-emissions hydrogen propulsion system. Both the main engine and gearbox will be removed, making room for a new modular propulsion system (electric motors, hydrogen tanks, a proton exchange membrane fuel cell system, and a battery pack). The fuel cell system will be triple redundant with 825 kW of capacity to supply propulsion and auxiliary power, while the 504 kWh lithium-ion battery pack will be used for peak shaving, secondary and bridging power. The system will contain a 750V DC bus bar and an e-motor for propulsion. The hydrogen and fuel cell system will be installed in the cargo space, with the

former being placed above the latter in two forty-foot containers (approx. 1,000kg at 300 bar). The compressed hydrogen tanks, the fuel cells, and the battery system will be separate units in order to be removed for maintenance or replacement purposes. The 110 m-long and 11.45 m-wide inland container vessel will be retrofitted at the Holland Shipyards Group's yard in Hardinxveld throughout Q3 2021 and is expected to be sailing 100% on hydrogen by December of this year. Once back in service between Rotterdam and Antwerp, Maas is expected to reduce greenhouse gas emissions by some 2,000t/year of Carbon Dioxide Equivalent. FPS aims to build a fleet of 10 zero-emissions inland and short sea vessels.

Alternative shipping fuels under Alfa Laval's scrutiny

The company's Test & Training Centre in the Danish Aalborg has begun looking into two types of marine fuels, methanol and biofuels made from waste. Alfa Laval will not only investigate the fuels' decarbonisation potential but also what measures will have to be taken to adapt and develop equipment for the vessel engine rooms. "A number of fuel pathways are on the table in the transition towards zero-carbon shipping, but the knowledge about their impact on marine equipment solutions is limited. We want to extend that knowledge through testing," Sameer Kalra, President Marine Division, Alfa Laval, underlined. The 2,800 m²-big testing space – already equipped for today's oil and gas fuels – has been readied for testing biofuels and methanol.

Working together with MAN Energy Solutions and other partners (the Danish Technological Institute, Technical University of Denmark, and the biofuel producer Nordic Green), Alfa Laval will explore the possibility of running the centre's four-stroke, 2.0 MW diesel engine on methanol – without modifications or another pilot fuel. Once the fuel has arrived, the first task has been to determine how to handle it at scale. Because methanol is a liquid at room temperature, it can be stored in unpressurised tanks. However, a low flashpoint of 7°C makes methanol highly volatile—despite the challenge of igniting it through compression. After working out the handling practicalities, broader tests of methanol in the unmodified engine will commence.

Wallenius Wilhelmsen moves forward with its wind-powered ship

The company will now conduct a comprehensive viability assessment in order to have the design ready by mid-2022 so as to contract a shipyard which, in turn, would deliver the vessel in 2025. *Orcelle Wind*, previously known as *Oceanbird*, will be a pure car & truck carrier, 220 m-long, 40 m-wide, and able to

carry 7,000 vehicles (incl. heavy machinery as well as break-bulk goods). She will primarily be propelled by wind, harvested with the use of telescopic sails. Wallenius Wilhelmsen speaks of a sailing speed of 10-12 knots under sail, increased with a supplemental power system if need be.

First sea test of Rabochaya's autonomous operations

Rosmorport's hopper barge has undergone an autonomous voyage outside the Port of Gelendzhik in the Black Sea, during which her abilities to detect targets have been tested, along with optimising manoeuvring. The MARINET Industry Center of the National Technology Initiative has initiated a project – supported by the ministries of Industry and Trade and of Transport of Russia, and the Russian Maritime Register of Shipping – tasked

with introducing unmanned shipping for Russian-flagged ships. Another of Rosmorport's vessels, the dredger *Redut*, has been equipped with remote controls for steering *Rabochaya*. Rosmorport plans to use such a setup to control an entire dredging fleet from a single point. According to Russia's Agency for Strategic Initiatives, technological solutions for autonomous ship operations will have been adopted for commercial fleet use by August 2021.

Three more parties join the Coalition for the Energy of the Future

Airbus, Bureau Veritas, and PSA International have joined the now 14-member-strong organisation tasked with accelerating the green energy transition in the transport & logistics industry. The Coalition was founded in late 2019 to drive the development of solutions to curb global warming, reduce air pollution, and protect biodiversity. Specifically, the members pool their R&D efforts in pursuit of three goals: increasing the availability of clean energy sources; lowering the energy consumption of transported goods

per kilometre-equivalent; and eliminating a substantial proportion of harmful emissions being released into the atmosphere. The Coalition has also unveiled its first seven projects it will be working on: hydrogen-run long-distance trucks; next-generation biofuels for shipping; carbon-neutral liquefied biogas; green electricity to power depots, terminals, and warehouses; zero-emission vehicles for road, air, and sea transportation; a digital door-to-door eco-calculator; and ways to make ports intermodal green hubs.

Yara-Statkraft-Aker Horizons green ammonia co-op

The trio has signed a letter of intent aimed at electrifying Yara's existing ammonia facility in Porsgrunn, hence making it a production base of zero-emission fuel for shipping, carbon-free fertilizer, and ammonia for industrial applications. Provided that power is available at the site and the required public co-funding is in place, the project could be realized within five-to-seven years. Making the Porsgrunn facility entirely green equals to getting rid

of more than 300k fossil fuel passenger cars. According to the parties, converting long-distance shipping to ammonia would require some 500-600mt of ammonia produced annually, i.e., three-four times more than what is the current global output. In addition to the Porsgrunn project, the companies plan to explore the potential for green ammonia production in Northern Norway as a future opportunity.

The Power-to-Ammonia project kicks off

DFDS, Arla, Maersk, Danish Crown, and DLG have partnered to increase the availability of green ammonia as an alternative fuel. The 50kt of yearly production capacity

Power-to-Ammonia facility will be based in Esbjerg and is expected to become operational in 2026. Green ammonia can be used as an energy carrier in solid oxide fuel cells.

Esbjerg-Atos green logistics partnership

The Danish seaport and the IT company are working on a solution to calculate the carbon footprint of individual routes and specific modes of transport. The Port of Esbjerg and Atos expect customers will enter relevant data into the system, such as departure location, final destination and

type of goods, and will then be provided with an overview of the most optimal routes. Customers will be able to pick the routes with the lowest environmental impact while, according to the parties, also achieving a financial gain through lower excise duties.

Autonomous trucks go online at CSP Abu Dhabi

The container terminal of COSCO Shipping Ports, operating within Abu Dhabi Ports' Khalifa, has put in place six electric Q-Trucks for supporting yard operations. The machinery produced by Qomolo, a sub-brand of ShangHai Westwell-Lab Technology Company, is equipped with a 360-degree sensory system with a traffic monitoring and driving guidance system

that enables operators to direct the vehicles' navigation and transportation of standard and refrigerated containers. The 80t of maximum load Q-Trucks run on a 281 kWh battery and have an operating range of 200 km/44 hours. The vehicles' electrical systems feature a temperature control system that extends battery life in extreme weather.

Gothenburg to house the Nordics' first future fuels station

The open-access facility, which the Norwegian Circle K will run, will provide heavy-duty vehicles with charging points and hydrogen gas and bio-based liquid fuel pumps. The station, located at Vädermotet, will start in 2022 by

offering ten charging points, with a maximum power capacity of 350 kW-1.0 MW (when fully developed). The 720 kg (15 trucks/day) of capacity hydrogen gas pump will be put in place in 2023/24.

Hirtshals eyes becoming a green hydrogen hub

The Danish seaport has signed a memorandum of understanding with the Norwegian Gen2 Energy to produce green hydrogen locally and take care of imports from Norway. The agreement also covers

the set-up of a container factory in Hirtshals for exporting hydrogen, thus demonstrating the security of supply. The parties intend to use electricity generated by wind farms to produce hydrogen.

ForSea's *Tycho Brahe* to be fitted with the world's largest battery pack

With the help of ABB, the Helsingborg-based ferry line will increase the ship's battery capacity from 4,160 to 6,400 kWh. The upgrade has started in May and will be completed later in 2021. Together with her sister ship *Aurora*, *Tycho Brahe* has been e-sailing between the Danish Helsingør and the Swedish Helsingborg since autumn 2018. According to the company, this has led to a CO₂ reduction of 37kt. ForSea underlines that it only

uses certified green electricity. "Since the start, ForSea has proven that battery-powered operations are possible on a ferry route like ForSea's. [...] one of our vessels – *Aurora* – already sails up to 46 departures per day on 99% electric power. Following the upgrade onboard *Tycho Brahe*, at full operation, both vessels will achieve a total reduction of carbon dioxide in ForSea's fleet by 65%, a total of 23,000 tonnes," Kristian Durhuus, ForSea's CEO, said.

Stena Line tests blue methanol

Within the EU backed FReSMe project, the Swedish ferry company has run its Stena Germanica (sailing on methanol since mid-2015) on recycled methanol coming from the country's steel industry. The blue methanol used by Stena

Line in the trial bunkering was produced from carbon dioxide recovered from the blast furnace gases from SSAB's steel production in Luleå (another partner of the FReSMe project).

Orlen launches Hydrogen Eagle

The Polish state-owned oil refiner and petrol retailer has announced it will create a production & distribution chain of low- and zero-emission hydrogen throughout Central Europe. The company intends to build six plants: three in Poland, two in Czechia, and one in Slovakia, with a total production capacity of 50kt by 2030. These electrolysis facilities, 250 MW combined, will be powered by renewable energy sources: solar and wind, including from Orlen and Northland Power's Baltic Power offshore farm (construction works on the potentially 1.2 GW-strong project will start in 2023).

The company also plans to erect hydrogen refuelling stations (for individual, public, and cargo transportation needs): 54, 26, and 22 in Poland, Slovakia, and Czechia, respectively. Orlen already operates pilot hydrogen refuelling points at its service stations in Wolfsburg and Müllheim in Germany. With the target total production capacity of over 1,000 kg per hour, the company is building three automotive-grade hydrogen production plants in Poland. In addition, Orlen wants to build three plants for converting municipal waste into low-emission hydrogen: two in Poland and one in Czechia.

World's first fully electric high-speed craft

Partners in the Transport – Advanced and Modular (TrAM) project have announced that the construction works on the passenger ferry *Medstraum* have begun in the Norwegian shipyard Fjellstrand. The 31 m-long and nine-metre-wide catamaran will have two electric motors and a 1.5 MWh-big battery pack (with 2.0 MW of charging power). Having a capacity for up to 150 passengers and designed for a service speed of 23 knots, the ship will begin trial crossings between Stavanger

and surrounding communities and islands in spring 2022 to test and validate the project findings. According to TrAM, *Medstraum* will be the world's first all-electric and zero-emission fast ferry classed under the International Code of Safety for High-Speed Crafts (HSC Code). *Medstraum's* hull and superstructure will be made from aluminium. The project aims to lower production costs and engineering hours for fast electric ferries by 25% and 70%, respectively, using advanced modularisation.

Vordingborg to house a green biofuel factory

Vordingborg Biofuel has announced its DKK2.0b (approx. 270m) plans to erect a renewables-powered biomethanol and e-methanol production plant in the Danish Port of Vordingborg. The company will use straws from wheat grain fields, pressed into briquettes, to make the fuel. During a biofermentation process, the briquettes will be converted partly into biogas and partly into

biofertiliser (the latter for use in agriculture). The biogas will then be converted to liquid biomethanol using surplus power from renewable energy sources. Estimates speak of a 300kt/year production capacity. According to expectations, the construction period will provide some 1,200 person-years of work. Once operational (in 2024), the plant will offer 25 permanent positions.

Study on making Bornholm a next-gen fuels bunkering hub

The Bornholm Bunker Hub consortium will investigate the potential of establishing a green maritime fuel bunkering station on the Danish island. The consortium's founding parties (Ørsted, Molslinjen, Haldor Topsøe, Bunker Holding Group, Wärtsilä, Rambøll, Bureau Veritas, and the Port of Rønne) will carry out a feasibility study to set out the financial potential

for supplying sustainable fuels, produced using offshore wind energy in the Baltic Sea. The project will investigate how local Power-to-X can support the need for sustainable fuels for the more than 60k ships that pass Bornholm every year. The project will also answer whether it is appropriate to produce green ammonia locally or if it should be imported.

Furetank's *Fure Vinga* gets Bureau Veritas' SMART notation

For the first time in the classification society's history, it has awarded a vessel a full suite of smart ship notations. The *Fure Vinga* tanker, designed by FKAB and built by China Merchants Jinling Shipyard (Yangzhou) Dingheng, has been equipped with smart systems for monitoring the ship's hull condition (H) as well as integrated machinery (M) and navigation (N) systems. Furetank's ship has optimised hull lines, a dual-fuel engine that can run on liquefied natural gas and liquid biogas, a battery pack for hybrid operations, and is fitted with a ducted propeller. The vessel's computer systems incorporate smart functions for the collection,

transmission, analysis, and visualisation of data to support the crew with informed decision-making to enhance safety and optimise operations and maintenance. The vessel complies with all tier one requirements included in Bureau Veritas' Rule Note Additional Service Feature SMART (NR675); hence it was granted the SMART (H1, M1, N1) notation. "The associated requirements have been specifically developed to set a benchmark for the safe and reliable design and operation of smart systems on board ships, covering both hardware and software, and includes extensive on-board system and integration testing," the classification society wrote in a press release.

Conductive charging to be tested in Helsingborg

The Swedish seaport has partnered with the also Swedish Elonroad to test a new electric road system. The solution will see the port's two e-vehicles charged from a power strip in the road, whether they are parked or on the move. Testing will begin this autumn. The power strips, approximately ten metres long, are glued to the asphalt and connected to a power source. The cars will have sliding contacts that automatically fold down to touch both the positive and negative terminals to transfer the energy

and charge the vehicle. According to the parties, conductive charging can transfer high power, up to 300kW per vehicle, with 97.5% efficiency. The municipal energy company Öresundskraft is also involved in the project, wanting to gain insights into the new technology and how electrifying the transport sector will impact the energy system. The domestic transport sector, primarily using fossil fuels, accounts for about one-third of Sweden's greenhouse gas emissions.

Meriaura eyes developing a carbon-neutral domestic traffic vessel

The Finnish Turku-based shipowner wants to create a hybrid ship to serve lake, canal, and sea feeder traffic, at the same time being 100% climate-neutral thanks to sailing on sustainably produced bio-oil and electricity stored in batteries. Once constructed, the vessel will be tested in Lake

Saimaa. The Saimaa canal locks are being extended, and the size of the new concept vessel corresponds to the new Saimax dimensions (93 m-long ships carrying up to 3,500t vs the current 82.5 m). The canal is the only water connection between the lake and the Gulf of Finland.

Awake.AI wins tender to provide vessel schedule estimates in Finland

Fintraffic, a governmental organisation that controls and manages traffic in Finland, has contracted the Finnish tech company to implement a new port call schedule system. The Port Call Time Stamp and Estimation Service will be based on machine learning and Artificial Intelligence (AI) data analysis. The forecasts will be influenced by many factors that will be analysed using global automatic identification system messages. In addition to automatic classifications, such as where a ship is coming from and where it is going, a ship's estimated arrival time will be influenced by many

variable factors, such as its speed and route, the weather, and the ice situation. By utilising machine learning, the service will remember what has happened in the past and how various factors have affected a ship's arrival time. The AI will learn the deviations for a particular locality and adjust its calculations accordingly. The new system will be put in place this autumn. Awake.AI will first technically customise the service to meet Fintraffic's needs. Afterwards, a test phase will follow, after which Fintraffic will mobilise the service for use at the country's ports through its Digitraffic API or the Port Activity app.

ION to help decarbonise the UK port sector

The Edinburgh-based software group has received a grant to advance port decarbonisation through its Marlin SmartPort climate-smart platform. The Data-Led Emissions Management (D-LEMA) project is part of the Clean Maritime Demonstration Competition, funded by the UK Department for Transport and delivered in partnership with Innovate UK. The half-year-long pilot study will validate whether vessel fuel usage and CO₂ emissions can be reliably estimated in and around ports using the International Maritime Organization global standard.

The Clean Maritime Demonstration Competition is a £20m investment from the government alongside a further £10m from industry to reduce emissions from the maritime sector. The programme supports 55 projects across the UK and will be used to support the research, design and development of zero-emission technology, plus infrastructure solutions to accelerate the industry's decarbonisation. The grant received by ION supports the UK's Ten Point Plan to address climate change and help achieve the country's net-zero emissions target by 2050.

AI Fuel Pilot onboard eighth Stena Line's ship

The Swedish ferry company has installed its in-house developed Artificial Intelligence (AI) fuel-saving solution on *Stena Nordica*, plying between Gdynia and Karlskrona. Fuel Pilot is a decision-making support tool that combines data from different sources – including wave, current, wind,

depth, given vessel's specifics, and timetable – to propose the optimal speed to cut fuel consumption, hence emissions. The company intends to reduce its carbon footprint by 30% by 2030, making its operations fossil-free by 2050 at the latest.

Gothenburg implements Allberth

The Swedish seaport is rolling out the digital berth planner tool, developed by the Finnish Awake.AI, to optimise port calls. "It is similar in many ways to a traditional school timetable, where a note is made of which ships are moored at the different berths. Using the map service, a time slot is chosen for a specific berth, allowing operatives to see which vessel is due to moor at a particular berth at a particular time. In certain instances, we can also see the planned position at

the quayside," Awake.AI said in a press release. Allberth offers two-way integration – for in-house use by berth planning personnel at the Port of Gothenburg and for external use by the various parties involved in calls (incl. pilots, mooring company personnel, and ship agents). Allberth is currently used by Port Control, which receives all calls at the Port of Gothenburg, and the safety and security coordinators at the Energy Terminal. External users will gradually join the system.

DFDS buys e-trucks

The Danish shipping line & logistics company has ordered 100 heavy-duty electric lorries from Volvo, set for delivery in 2022-2023. The 44t of carrying capacity (gross combination weight)

FM Electric model can travel up to 300 km when fully charged. The e-trucks will help DFDS in cutting its carbon footprint by 45% by 2030.



Photo: DFDS

A digital test field in Kiel

Germany's Federal Ministry of Transport and Digital Infrastructure will fund the establishment and operation of a digital test field in the Port of Kiel. As part of the D-TECH-BASE project, ro-ro terminals in the port's Ostuferhafen and Schwedenkai will become test fields for new 5G communication and traffic control. The 1.75m worth project, to last until 30 June 2024, will see the set-up of a 5G campus network for fast data transmission, allowing for, among others, tagless optical unit tracking. A fleet management system is also planned, enabling the connection and scheduling of all terminal forklift trucks in real-time. Smart multimedia screens are also planned, displaying dynamic content, such as traffic guidance information imported from the gate operating system. As part of the work package

for intelligent traffic control, more video scanning gates for trucks and trailers will be installed at both harbours. Gates for rail freight traffic will be erected for the first time. New camera systems with optical character recognition (OCR) will support transport unit data collection. OCR input will be compared with the port's terminal operating system data to minimise distances and reduce mileage-related emissions. At the same time, the Port of Kiel partakes in the Förde 5G project together with the Christian-Albrechts University of Kiel and other partners. Within this initiative, IT systems will be developed on an industrial scale to promote tech-driven gains in tracking, cargo handling, and IT security (solutions developed within Förde 5G specifically aim at optimising storage, transfer, and retrieval processes).

Port of Esbjerg-Valmont SM offshore wind energy co-op

The two have signed an agreement according to which the former will erect a wind turbine tower factory in the Danish port. The investment is scheduled for completion in late 2023. Valmont SM will use it to manufacture wind turbine towers for the company's client base, including Siemens and Vestas. The agreement forms part of Esbjerg's larger green master plan. In 2020, the

Nordic infrastructure fund Infranode announced a DKK1.0b-big (approx. 130m) investment scheme, following which facilities for manufacturing and warehousing offshore wind components will be set up in the seaport. "These investments will be implemented as producers of wind turbine components, and service providers step up their activities," the port authority says.

Yara Birkeland's maiden voyage

The world's first electric and self-propelled container ship has set sail, visiting the Oslo fjord before starting commercial operations in 2022. The 80 by 15 m vessel, able to take 120 TEUs on board, will ply between the Norwegian Porsgrunn and Brevik. She will transport mineral fertilisers, taking some 40k/year truck trips off the country's roads. *Yara Birkeland's* equipment, delivered by Kongsberg, will undergo testing towards autonomous and all-electric operations

(Leclanché's 6.7 MWh lithium-ion battery system) during the following two years. Maasterly, a JV between Kongsberg and Wilhelmssen, will operate the container carrier from its monitoring and operations centre in Horten. *Yara Birkeland* has been constructed by the VARD shipyard, with Enova's, Norway's governmental enterprise responsible for the promotion of renewable energy, support of NOK133.5m (ca. €13.3m).

Ammonia fuel cell MoU

Eidesvik Offshore, Aker BP, and Alma have partnered to investigate retrofitting two offshore support vessels with ammonia fuel cells. The parties intend to install Alma's solution onboard

Eidesvik's *Viking Lady* and Aker BP's *NS Frayja* (currently under Eidesvik's management). The memorandum of understanding includes an option to retrofit other vessels.

DSV invests in automated warehouses

The company will set up 20 large-scale multi-user fulfilment centres across Europe, North America, and Asia-Pacific. The facilities, based on AutoStore technology with goods-to-person automated workstations, will be part of the company's larger campuses. The DSV Fulfilment Factories will be connected on a 'string,' meaning that one company can have stock placed in multiple warehouses across regions or continents while at the same time having a unified stock overview. The interconnectivity system will automatically

choose the product at the warehouse closest to the delivery point. Four facilities are already operational (in Kolding, Oslo, Helsinki, and Venlo), and six are underway (Northamptonshire, Duisburg, Barcelona, Toronto, Stockholm, and Copenhagen). The remaining ones will be erected in North America and Asia-Pacific in the coming few years. "With DSV, Fulfilment Factory companies do not need to be multinational to get automated, competitive and efficient warehousing," Ronald Poort, Executive Vice President, DSV, underlined.

World's first test of CARBON capture onboard a ship

With the help of the project partners Mitsubishi Shipbuilding and ClassNK, K Line has successfully tested a demonstration plant for carbon dioxide capture installed on the coal carrier *Corona Utility*. The Japanese shipping company says it has been able to catch and store CO₂ with

a purity level of more than 99.9%. "[...] the captured CO₂ is expected to be recycled as a new CO₂ source for Enhanced Oil Recovery [...] processes or as raw material in synthetic fuel through methanation," K Line shared in a press release from August 2020 when it revealed the CC-Ocean Project.

Shoreham Port to go zero-emission thanks to green hydrogen

The English seaport has partnered with H2 Green to set up the Clean Energy Hub to remove emissions from its forklift truck and heavy goods vehicle (HGVs) fleet. Subsequently, the parties intend for the hub to catalyse decarbonisation throughout Southeast England, with the ambition to supply hydrogen to other HGVs serving port traffic and nearby industries, including gas-fired power generation, timber and steel handling, and water treatment. "Decarbonisation of the HGVs and forklift trucks entering and using the port would save 45,000 tonnes of CO₂ each year," Luke Johnson,

Managing Director, H2 Green, highlighted. Additionally, byproducts such as oxygen can be used to treat local sewage to prevent planned releases to the sea. The Clean Energy Hub will be integrated with offshore wind and solar power generation. The plans also include an ammonia import facility, with ammonia used as a hydrogen carrier. The investment will help Shoreham Port to achieve its net-zero by 2030 goal. After finalising engineering designs and receiving planning approvals, the parties expect to move to a structured series of final investment decisions in the second half of 2022.

Sailing power banks

Rederi AB Gotland's subsidiary Gotland Tech Development, Helios Nordic Energy, METS Technology and ABB have received financial support to investigate the electrification of Destination Gotland's ferries. The funds, SEK1.2m (120k) granted through the Swedish Energy Agency's Energy Pilot Gotland programme, will be used for studying the feasibility of replacing the ships' generators with batteries to provide electricity for onboard use by passengers, including charging e-vehicles. The project aims

at reducing the carbon footprint of the ferries that link Gotland with the Swedish mainland by one-tenth.

The vessels' power banks will be recharged during port calls from Helios Nordic Energy's solar farms. The company's Project Manager Magnus Rahm commented, "Electrifying large fast ships is a great challenge in itself due to the very large capacity requirements. But in this case, we are also dealing with the heavily constrained grid on Gotland."

A hydrogen production plant in Gothenburg

The Gothenburg Port Authority and the Norwegian energy company Statkraft are investigating the set-up of a 4.0 MW facility in the Swedish seaport. The parties are conducting a preliminary study, chiefly focused on safety aspects, which

is expected to be completed at the beginning of 2022. Once inked, the SEK60m (€6.1m) investment can be up and running in 2023, delivering two tonnes of hydrogen per day.



**"THE BEST
MAP OF
THE NEW
SILK ROAD!"**

MARCO POLO™

* NOT A REAL QUOTE (BUT WOULD BE IF
MARCO POLO WAS HERE WITH US – SCAN
THE QR CODE AND CHECK FOR YOURSELF!)





LINER SERVICE EUROPE GREAT LAKES

The first and only year-round liner service between Europe and the Great lakes

Quick transit time | Through bills of lading | Onward connections using Spliethoff's European and American logistic network | Line-supplied containers, project, heavy lift, steel, forest products and bulk |

Calling various Great Lake ports, including:

- Valleyfield QC
- Cleveland OH
- Duluth MN
- Ramey's Bend ON
- Chicago IL
- Monroe MI

www.spliethoff.com or greatlakes@spliethoff.com

CLEVELANDEUROPE EXPRESS
OPERATED BY  **Spliethoff**



reads

The Poseidon Principles' first report highlights banks' influence on carbon emissions from maritime transport

Photo: Canva

Shipping's climate footprint and the financial industry

by Ewa Kočańska

In their first Annual Disclosure Report 2020, the Signatories of the Poseidon Principles have publicised their ship finance portfolios' climate alignment scores for 2019. As the first sector-specific climate initiative for lending institutions, the initiative demonstrates how the financial sector can help move industries towards a low carbon future by ensuring their investments are environmentally responsible. With 20 leading banks as Signatories, one-third of global shipping finance power is now part of the Poseidon Principles initiative. According to the results, just three out of the 15 financial institutions included in the report align with the decarbonisation targets set by the International Maritime Organization (IMO).

The Poseidon Principles, launched in June of 2019 by the Global Maritime Forum, provides a global framework through which decarbonisation efforts in the shipping industry align with financial and lending decisions, consistent with IMO objectives. The report, released in December 2020, draws the banking industry's attention to the fact that they have been issuing loans to major industries without giving enough consideration to the ecological consequences of their investments. This initiative directly involves the financial sector in greenhouse gas (GHG) emissions reduction through measured, data-based, and transparent, environmentally conscious lending.

The Poseidon Principles decarbonisation strategy aims to reduce the total annual GHG emissions by at least 50% compared to 2008 (the IMO Absolute Target) and to reduce CO₂ emissions per transport work by at least 40% by 2030, pursuing

efforts towards 70% by 2050 compared to 2008 (the IMO Intensity Targets).

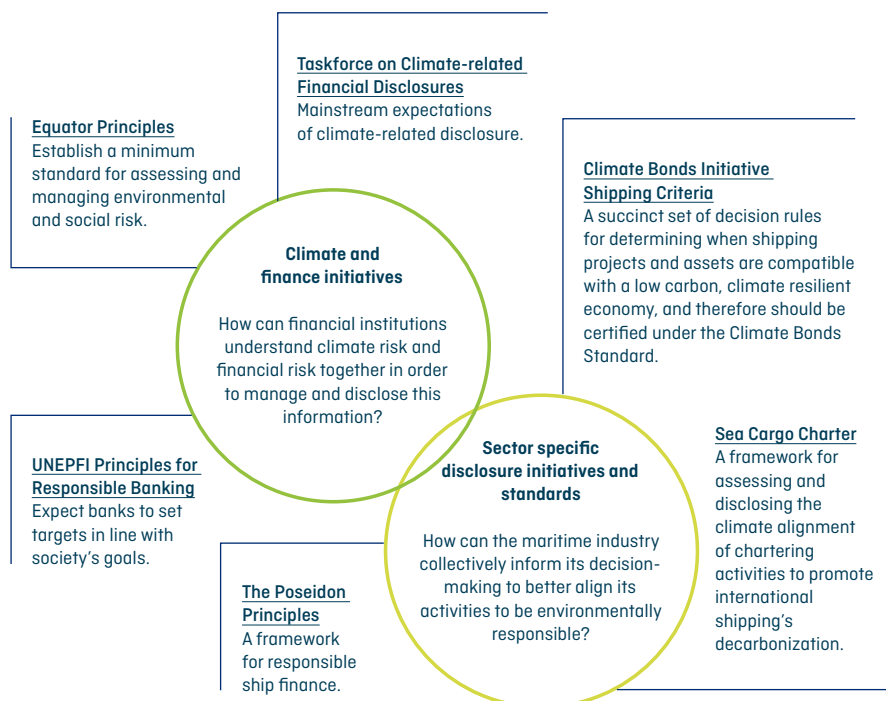
The members also strive to actively work with their clients and partners to implement the four Poseidon Principles. These principles include an annual assessment of climate alignment – where each member assesses its climate alignment according to the Technical Guidance for all Business Activities; accountability – where Signatories commit only to use data types and sources as well as service providers identified in the Technical Guidance in their alignment analysis; enforcement – where Signatories contractually require compliance with the Poseidon Principles in new business activities; and transparency – where Signatories publicly acknowledge membership in the Poseidon Principles initiative and publish their shipping portfolio climate alignment score annually. These principles are not designed to be static; it is expected they will change according

to the data collected, new research, and variations in global climate-related targets (and possibly also feedback from stakeholders who aren't directly involved).

The (mis)alignment

The climate alignment indicator measures (in percentages) the deviation between a vessel's carbon intensity against the one required to be in line with a decarbonisation trajectory that meets the IMO objectives. Ship's carbon intensity depends on several factors such as its size, type, and cargo loads; it is also sensitive to speed, amount of time spent in port and at sea. A new IMO regulation requires owners of ships of gross tonnage 5,000 and above to collect data, which allows for calculations of the Annual Efficiency Ratio (AER). AER considers fuel consumption, distance travelled, and deadweight tonnage at summer draught, and that's the metric that has been adopted by the Poseidon Principles to measure ships' climate alignment.

Fig. 1. How the Poseidon Principles came to be

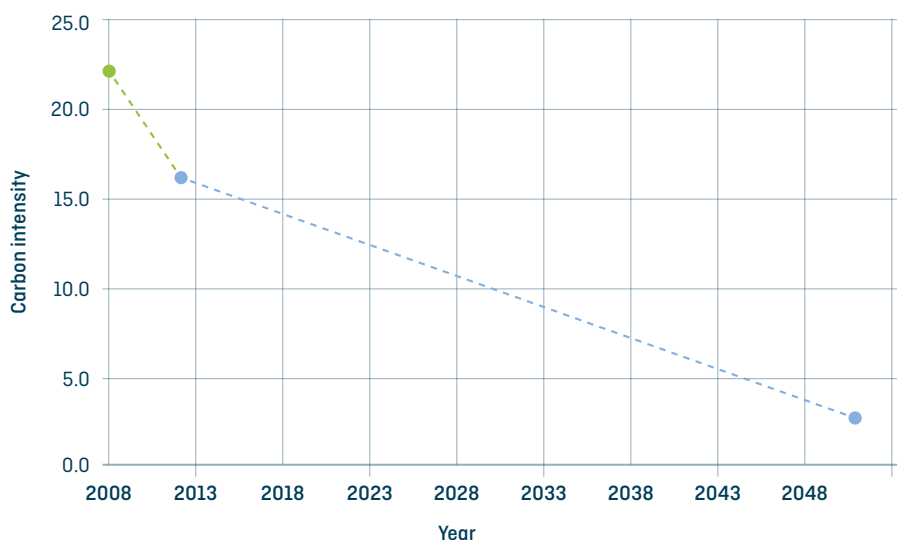


Source for all figs. and Tab. 1: Poseidon Principles. Annual Disclosure Report 2020

Fig. 2. Global carbon intensity trajectory

	2008	2012	2050
Total transport demand (million tonnes)	42,000	49,000	169,000
Total CO ₂ emissions (million tonnes)	921	796	461
Estimated aggregate carbon intensity (gCO ₂ /tnm)	22.0	16.3	2.7

Transport demand, emissions and carbon intensity for international shipping



Out of the 15 Signatories included in the annual report, three portfolios aligned with the IMO's initial GHG strategy. These include Export Credit Norway, with a portfolio score of -44.92% alignment delta (the lower the number, the more IMO-aligned the institution), Bpifrance Assurance Export

(-43.43%), and ING (-0.36%). The average score was +1.2% above the benchmark, and the scores ranged from -44.92% to +32%. Out of the misaligned Signatories, half scored +5% or less. Sparebanken Vest (+29.11%) and Amsterdam Trade Bank (ATB; +31.58%) are two institutions that are

most out of alignment with the Poseidon Principles emissions reduction targets.

The banking institutions attribute their results to a plethora of reasons, but all are overall satisfied with the tools, data, and carbon emissions analysis provided by the Poseidon Principles. For instance, ING representative explains that thanks to the initiative, the bank has "quantitative data" to communicate with clients and stakeholders to further support them in achieving their decarbonisation goals. IGN's Stephen Fewster, Global Head of Shipping Finance, attributed his organisation's positive results to their clients, "I am delighted to report our first portfolio result under the Poseidon Principles aligns with the IMO pathway. This reflects our focus on lending to first-class owners and financing modern assets. However, this is only the start, and I look forward to cooperating with the Poseidon Principles Association and clients to ensure that the industry meets the IMO 2030 and 2050 targets." Likewise, Nordea (+6.7%), one of the founding Signatories, appreciates the instruments and important data from the Poseidon Principles which serves as a "good starting point" to do an in-depth analysis of their shipping portfolio. "The data from the Poseidon Principles will over time enable us to gain additional insight into our shipping portfolio and enable a fact-based dialogue with our customers regarding decarbonisation," said the Nordea statement included in the report.

Decarbonisation marathon: when age isn't a problem, but size does matter

In terms of shipping finance portfolios and their climate alignment, a portfolio can easily align either by having a high number of aligned vessels or high loan values pertaining to the aligned ships – or some combination of the two; while, of course, the opposite will work against the portfolio. Also, by having a smaller number of vessels, the portfolio becomes that much more dependent on the individual's alignment score, especially if the ship also carries more debt. "On this basis, some financial institutions found that a limited number of vessels accounted for a significant portion of their overall score," according to the report.

To that end, Sparebanken Vest believes that it is indeed the small number of ships in their portfolio that's most responsible for their misalignment with the targets. "A limited number of vessels account for a significant portion of our total negative deviation on a portfolio basis. The Poseidon Principles are a highly useful tool for increasing our interaction with clients on environmental issues," said Sparebanken Vest's Ragnhild Janbu Fresvik, Group Director, Commercial Banking. The institution hopes that with the information and tools provided through the Poseidon Principles, they

Fig. 3. The four Poseidon Principles

The Principles

Principle 1

Assessment of climate alignment

“ We will annually assess climate alignment in line with the Technical Guidance for all Business Activities. ”

Our commitment:

Signatories will, on an annual basis, measure the carbon intensity and assess climate alignment (carbon intensity relative to established decarbonization trajectories) of their shipping portfolios. This requirement takes effect for each Signatory in the following calendar year after the calendar year in which it became a Signatory.

Principle 2

Accountability

“ We recognize the important role that classification societies and other IMO-Recognized Organizations (“RO”) play in providing unbiased information to the industry and the mandatory regulation established by the IMO for the data collection and reporting of fuel oil consumption from ships, (the “IMO DCS”). We will rely on such entities and mandatory regulations as explicitly identified in the Technical Guidance for the provision of information used to assess and report on climate alignment. ”

Our commitment:

For each step in the assessment of climate alignment, Signatories will rely exclusively on the data types, data sources, and service providers identified in the Technical Guidance.

Principle 3

Enforcement

“ We will require that ongoing compliance with the Poseidon Principles is made contractual in our new Business Activities using standardized covenant clauses. We will contribute to the update and addition of standardized clauses through the annual review process. ”

Our commitment:

Signatories will agree to work with clients and partners to covenant the provision of necessary information to calculate carbon intensity and climate alignment.

Principle 4

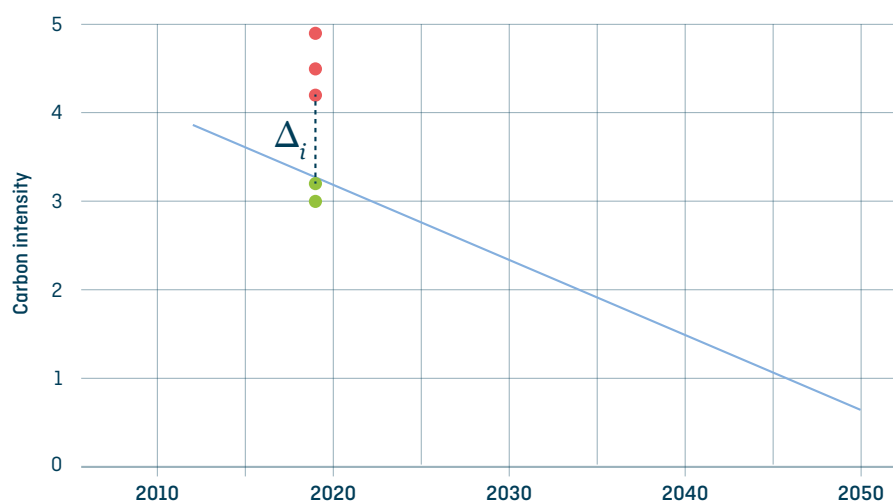
Transparency

“ We will publicly acknowledge that we are a Signatory of the Poseidon Principles and we will publish the portfolio climate alignment score of our Business Activities on an annual basis in line with the Technical Guidance. ”

Our commitment:

1. Upon becoming a Signatory, the Signatory will publicly acknowledge that it is a Signatory of the Poseidon Principles.
2. On an annual basis, each Signatory will report the overall climate alignment of its shipping portfolio and supporting information, as per the Accountability requirements, to the Secretariat no later than 30 November. This requirement takes effect for each Signatory in the calendar year after the calendar year in which it became a Signatory.
3. On an annual basis, each Signatory will publish the overall climate alignment of its shipping portfolio in relevant institutional reports on a timeline that is appropriate for that Signatory. This requirement takes effect for each Signatory in the calendar year after the calendar year in which it became a Signatory.

Fig. 4. Assessing alignment at the vessel level



will be able to address the issue with the ship owner and correct their trajectory.

On the other side of that coin sits Export Credit Norway, a bank which mostly finances newbuilds. Their very good score of -44.92% is primarily due to the fact that their portfolio under the Poseidon Principles scope is “very limited, as most of our vessels are offshore service vessels which are not considered to be trading internationally and/or are below dwt 5,000” and therefore are not included in the report.

Perhaps surprisingly, the analysis found that vessel age may not play as big a role as it might have been assumed. The common thinking is that a newer ship will have a better carbon intensity. However, it appears that the ship’s operational factors, such as speed or time spend in port, affect its carbon intensity to such an extent that sometimes the oldest vessels have the best carbon intensity. For example, Crédit Industriel et Commercial (+1.1%) emphasised that while technical specifications play an essential role in the

assessment, the “operation management” turned out to be especially significant in their score. Moreover, age is not a problem as long as the vessel is effectively operated, and when that’s the case, it can “even stand below the reference curve.”

Additionally, ATB, while recognising that it is “noticeably out of alignment” with the Poseidon Principles’ emission reduction targets, has taken steps to identify ships that have contributed to the subpar score. The bank said that thanks to the Principles-inspired analysis, they will now seek to finance more fuel-efficient ships, also paying attention to the vessel’s trading patterns which they found to be significant. “For instance, a large vessel with a large engine is likely not to be efficiently utilised on short routes and consequently its high emissions compared to the work done can influence the bank’s decision to finance it,” reads the ATB statement. Despite his bank’s below par score, Iraklis Tsirigotis, Head of Shipping Finance, Managing Director, is glad that the organisation has completed its first Poseidon Principles evaluation. “This is another concrete step for ATB to continue to improve further its Shipping Finance business while accounting for its environmental impact. This is not a sprint, but rather a marathon which requires a lot of small, but steady steps over time,” said Tsirigotis.

Further, ongoing investments in green- ing and maintenance of existing vessels can benefit decarbonisation efforts of a portfolio. The Crédit Agricole Corporate and Investment Bank (+0.44%), believes that its continued financial support, despite an economic downturn, of shipping clients in “renewal and rejuvenation of their fleets” has contributed to their good score. “Reducing the carbon footprint of the maritime industry should be a priority for us all. As one of the world’s leading ship-finance banks, Credit Agricole CIB will be there to support the ship-owning community in their initiatives and investments leading to measurable and sustainable decarbonisation of our shipping industry,” said the bank’s Thibaud Escoffier, Managing Director, Global Head of Ship Finance.

Clearly, this first report has allowed the Signatories to better understand the drivers of the ships’ carbon intensity in their portfolios and therefore cooperate with their clients and stakeholders to improve the industry’s GHG footprint. Statement from Citi (+6%), a founding Signatory, says that going forward, the organisation will consider “factors such as estimated alignment delta, age of vessel(s), retrofits, new fuel efficiency technologies, the operator’s efficiency track record, and the usual risk assessment” in all new financing as well as renewals. These points will then be assessed in regard to the overall portfolio to make sure that it aligns with the IMO emissions trajectory.

Moreover, the initiative helps organisations meet climate goals of other global climate initiatives. For example, BNP Paribas (+2.88%) said that the Poseidon Principles data are an important “building block” for the institution to align itself with the Paris Agreement objectives. “We are committed to ensuring that our business is conducted in an environmentally responsible way and will continue to support this through our business strategy and together with our clients,” said BNP Paribas’ Vincent Pascal, Head of Shipping and Offshore Finance EMEA.

Open to criticism (and ‘cat’ diagrams)

The Warsaw-based maritime and climate change **Gliese Foundation** touched upon some problems within the report and offered advice on how to improve the reporting in the coming years. For example, the report says that their 20 signatories represent \$150 billion; however, the share of each bank is not disclosed. The report also doesn’t specify if any percentage (and if so – what percentage) of the bank’s portfolio was excluded from the analysis. Furthermore, it’s unclear whether each bank’s estimates were done internally (allowed pathway track) or by classification society

Tab. 1. The Poseidon Principles’ Signatories’ scores

No	Name	Score
1	Export Credit Norway	-44.92%
2	Bpifrance Assurance Export	-43.43%
3	ING	-0.36%
4	Crédit Agricole Corporate and Investment Bank	+0.44%
5	Crédit Industriel et Commercial	+1.1%
6	Société Générale	+2.05%
7	DNB	+2.5%
8	BNP Paribas	+2.88%
9	ABN AMRO	+5%
10	Citi	+6%
11	Nordea	+6.7%
12	Danish Ship Finance	+6.72%
13	Danske Bank	+11.9%
14	Amsterdam Trade Bank	+31.58%
15	DVB	– ¹

¹ Non-reporting

(preferred pathway track). The Foundation believes that the above information is critical in properly assessing portfolio scores.

Moreover, according to the Gliese Foundation, the most important issue with the report has to do with the +1.2% average score of portfolio climate alignment; they believe that this number gives the wrong impression of the financial institutions as a whole being just 1.2% off from the ideal trajectory. The Foundation assumes (since it’s not otherwise specified) that the 1.2 number is a simple average and not a weighted one of the 15 members’ scores. The results of a few particularly well-performing or poorly doing institutions were certainly heavily influenced by a small portfolio of vessels with either high or low emissions, affecting the overall average.

The Gliese Foundation supposes that the actual weighted average is closer to 2.5-6%. The organisation has requested either information on each bank’s shares from the total amount of the 15 reporting banks or the weighted average, calling the simple average “meaningless.” They also believe that given the four significant outliers among the banks, a box-and-whisker diagram would better illustrate the data. “The final results would be better captured in a small-size box with very long whiskers. If it were a cat, its mouth would have been small with whiskers quite long!,” said the Gliese Foundation in their analysis of the report.

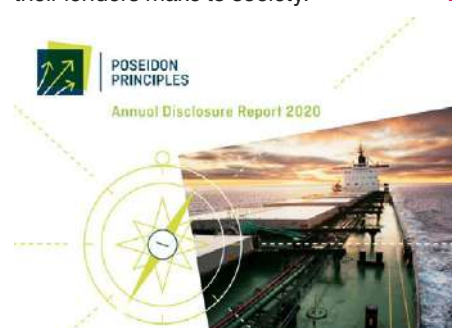
Decarbonisation springboard

Evidently, the Poseidon Principles *Annual Disclosure Report 2020* illustrates how by understanding what makes a ship carbon-efficient, financial institutions, through open dialogue and cooperation with clients, can establish proper fleet

requirements to ensure their investments actively contribute to a GHG emissions reduction in the shipping industry. And even though, as the Gliese Foundation pointed out, some improvements in analysis and transparency methods could be implemented, the initiative certainly has an ability to be a driver for environmental responsibility and carbon neutrality.

As the first industry-specific project that assesses and publicly reports real emissions figures, the Poseidon Principles initiative can serve as an example for global organisations to start using financial investments as a springboard for decarbonisation of other sectors. Despite its critique, the Gliese Foundation underscored its overall support for the project, “In summary, the Poseidon Principles released a good report. We welcome and congratulate the signatories for this comprehensive document. If some parts of our policy brief may sound critical, it is because we are convinced that an essential role of institutions of the civil society, like Gliese Foundation, is to encourage public and private sector stakeholders to improve their disclosures and transparency.”

Indeed, this initiative could evolve to include other global issues where financial institutions’ collective influence can help improve and increase the contribution industries and their lenders make to society. ■





The road towards climate neutrality is founded on (mostly) regulation

Fragment of Hercules and the Lernaean Hydra by Gustave Moreau; photos: Art Institute of Chicago

Will the European Green Deal make ports' future sustainable?

by **Dr. Kai-Dieter Classen**, LL.M. (Berkeley), Deputy Director of the External Affairs Division, and **Manfred Lebmeier**, Senior Environmental Advisor in the Environment & Sustainability Division, Hamburg Port Authority¹

The European Green Deal (EGD) is a set of comprehensive policy initiatives by the European Commission (COM) aimed at achieving climate neutrality in Europe by 2050. It will affect all European industries, in particular transport, with ports very much included. For the impact to be significant – and positive – EGD-related policies will have to be carefully revised and adjusted accordingly. In sum, this is a Herculean task.



Kai-Dieter Classen is a Strategic Legal and Policy Advisor to the management of the Hamburg Port Authority. He represents Hamburg in several Committees of the European Sea Ports Organisation. As an Adjunct Professor at Hamburg University's Law School, he teaches WTO-Law and European Seaports Law. Prior to joining the Hamburg Port Authority, he served, i.a., as an Official for the Hamburg State Government and as a National Expert in the EU Commission's Legal Service.



Manfred Lebmeier is an Environmental Engineer and works for the Hamburg Port Authority's Environmental and Sustainability Department as Senior Environmental Advisor. He represents Hamburg in the European Sea Ports Organisation's Sustainable Development Committee. Before joining the Hamburg Port Authority, he held the position of Group Environmental Officer at the Allianz Group in his hometown of Munich.

The In December 2019, the new COM presented the core of its governmental programme – the EGD. It addresses some of the most urgent mega-trends of our times, which can be, by all means, considered as this generation's defining task. The most prominent is climate change, followed by the loss of biodiversity, pollution and destruction of ecosystems, and the waste of resources. To counteract these across the board, the COM identified various measures which shall be driven or supported by regulation and fiscal measures. Overall, it suggests making the EU's economy decarbonised, digitalised, and circular, a move that is hoped to create new commercial sectors and business models along the way. Even though no stones are to be left unturned by the EDG, an immediate focus lies on the transport sector – and consequently, on ports.

¹ This article represents the authors' personal views.

The most prominent part of the EDG currently in the legislative process is the proposal for the European Climate Law. This proposal aims to establish the framework for achieving EU climate neutrality in 2050 (incl. defining a trajectory towards it, such as an intermediate target for 2030). The COM's proposal increases the CO₂ reduction target for 2030 to 55%, which was originally set at a 40% reduction in emissions compared to 1990 by the 2013

Climate Change Adaptation Strategy (the European Parliament even suggested raising this intermediate target to 60%).

Meanwhile, another and quite complex policy is taking shape, intending to support the EDG objectives by way of fiscal measures. The purpose of Regulation 2020/852 on the establishment of a framework to facilitate sustainable investment (Taxonomy Regulation) is to direct investments in the EU towards sustainable projects and

activities. Therefore, it establishes criteria for determining whether an economic activity qualifies as environmentally sustainable. While this regulation has already been in place since June 2020, the supporting delegated acts, which will contain the technical screening criteria, are in the making. Once completed, this set of rules is going to have a big impact on the EU funding policy, as unsustainable projects are not likely to be eligible anymore.

REVISIONS, REVISIONS

Several current initiatives of the COM have repercussions for ports on short notice, among others, the revision of the Energy Taxation Directive 2003/96/EC (which will presumably be completed in summer 2021). Energy taxation is relevant to the overall cost of onshore power supply (OPS), liquefied natural gas (LNG), bunker, and net-zero-carbon fuels and other forms of energy – as a result, it bears a significant impact on the attractiveness of both established and alternative means of power generation. Under the proposed FuelEU Maritime Initiative, the demand side of shipping will be in focus. The announced directive seeks to increase the use of sustainable alternative fuels in European shipping and ports by addressing market barriers and uncertainty about technical options. Likely, it will regulate the emission behaviour of vessels in ports and at berth. The controversial and increasingly heated discussion on the inclusion of shipping in the European Emission Trading Scheme (ETS) is in full progress. Concerning infrastructure, two initiatives deserve the ports' full attention.

First, the revision of the TEN-T Regulation. In 2013, the EU laid down its infrastructure policy regarding transport in Regulation 1315/2013 on Union guidelines for the development of the Trans-European Transport Network (TEN-T). Notably, the EU recognized more than 300 European ports as essential nodes in the defined Core and Comprehensive Networks. This decision has an impact on many fields of EU policy, i.e., on state aid law, where the character of a port being part of either the Core or Comprehensive network is an important aspect in framing a positive notification decision. The corresponding Regulation 1316/2013, establishing the Connecting Europe Facility (CEF), provides the funding instrument for EU's

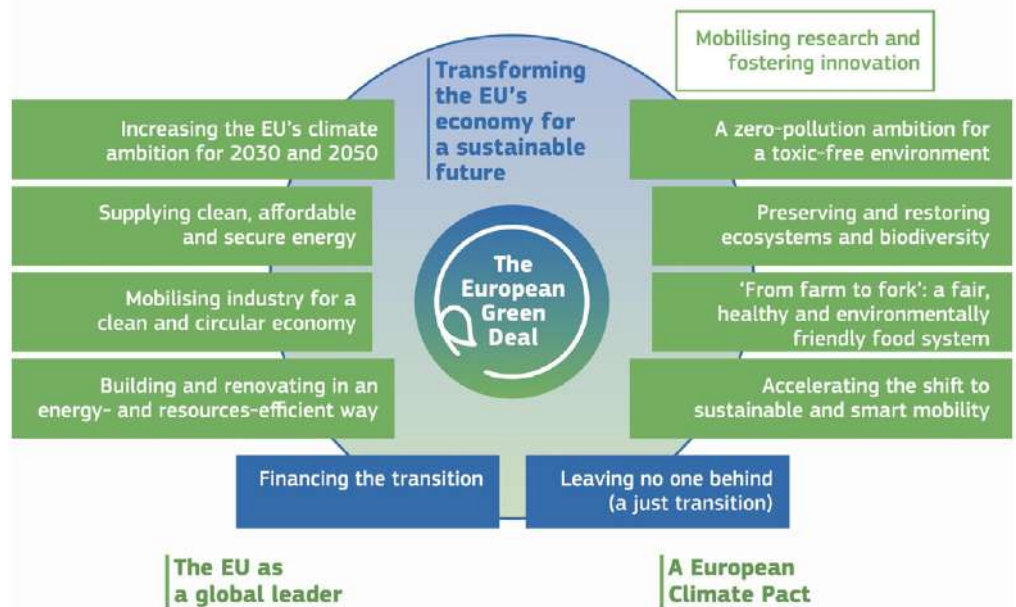
strategic investments in transport, energy, and digital infrastructure. According to an informal agreement (reached during passing for press), the CEF transport budget for the 2021-2027 term will be 25.81b (incl. 11.29b for Cohesion Countries).

All things considered, the TEN-T policy is of critical importance to ports. According to the COM's Green Deal Action Plan, a proposal for a revision of the TEN-T regulation is planned. The main problem of the current TEN-T regulation, according to COM, is its insufficient effectiveness to stimulate zero- and low-emission transportation. It seems that the COM intends to gear a revised TEN-T Regulation away from classical infrastructure policy and towards an instrument with a strong decarbonisation impact. This shall include, i.e., supporting the deployment of high-power charging facilities and new flexible bunkering infrastructures to provide large quantities of sustainable alternative fuels for different shipping segments in European

sea- and inland ports. In this respect, the COM tends to blur the demarcation lines between infrastructure and transport policy and needs to establish a clear border between the TEN-T revision and our second focus point, the ongoing revision of the Alternative Fuels Infrastructure (AFI) Directive.

A clean port starts with clean ships. To that end, the AFI Directive 2014/94 on the deployment of alternative fuels infrastructure creates a common framework for the development and realisation of such infrastructures in the EU, notably in ports. It marks the first decarbonisation efforts of the EU by means of supporting infrastructure policy. The main idea was to make setting up infrastructure for LNG bunkering and OPS mandatory in TEN-T Core Ports. At the time of drafting the AFI Directive, LNG and OPS were considered the silver bullets for shipping to solve the emission issues at sea and berth. Eight years on, it is apparent the original approach failed for several reasons. As a standalone measure,

THE EUROPEAN GREEN DEAL





it addressed only the supply side – there was no regulatory support targeting the demand side. And, instead of being technology-neutral, it prescribed two solutions without a deeper understanding of the economic rules and forces applying to the shipping business. As long as traditional fuels are dramatically cheaper and available pretty much anywhere, the pressure on freight rates will continue to discourage the uptake of sustainable alternative fuels or the use of (electricity-taxed) OPS, putting the first-movers, shipping companies

and ports alike at a significant competitive disadvantage.

In April 2020, the COM started a revision of the AFI Directive with the objective of building-up a dense and easy-to-use alternative fuels infrastructure network for land vehicles, vessels, and aircraft. However, it seems that the COM, by following the mantra of ‘more is better,’ now runs the risk of treading even farther – and increasingly faster – down the inconclusive path taken in 2014. LNG is still regarded as a highflying new fuel, used by less than 1%

of the merchant fleet; in addition, as a fossil fuel, its CO₂ saving potential is nil. The construction of OPS infrastructure could become mandatory for TEN-T Core Ports, a move that may backfire at least at two levels. These are costly installations, to begin with, especially those for serving the needs of cruise ships, with no guarantee the shipping side will make use of it; at the same time, given the ‘wrong’ power mix using OPS can actually increase CO₂ emissions. Establishing infrastructures for net-zero-carbon fuels is not the focus.

ZERO-EMISSION AT BERTH: A GOAL-BASED TECHNOLOGY-NEUTRAL APPROACH

Under the EDG, the COM, fortunately, seems to take a holistic approach to decarbonising transportation, as its parallel engagement with Energy Taxation, ETS, the TEN-T Regulation, the AFI Directive, and additionally the FuelEU Maritime initiative indicates. And yet, the challenge of the huge difference in costs between fossil fuels and sustainable alternatives will probably remain unsolved. All vessels in all ports should contribute to climate change mitigation and air pollution reduction. Shipping lines should not be able to bypass offers of clean alternatives, neither the availability of green electricity as a prerequisite for genuine emission reductions by means of OPS should be omitted.

Thus, prescribing a specific technical solution in binding EU legislation at this time will most likely produce stranded assets, in many cases at the expense of the taxpayer, leaving the competition with cheaper fossil fuels untouched. A goal-based, technology-neutral approach seems economically and ecologically much more worthwhile: a zero-emission limit at berth, that is.

With this requirement, it is up to ship owners to decide for each vessel on the best way to comply, which might vary from port to port. Once traditional fossil fuels are no longer the price benchmark due to the zero-emission at berth requirement, OPS will be one of the cheapest solutions in terms of operational expenditures, thus attractive to invest in and

use. New solutions for ship propulsion, like net-zero-carbon fuels (e.g., hydrogen, ammonia, or methanol), batteries, or fuel cells, will become competitive as they will no longer run against cheap fossil fuels. Additionally, the zero-emission at berth standard would allow the COM to focus the revision of the TEN-T Regulation and the AFI Directive on their respective hitherto regulatory core. In the case of the latter, the revision should only centre around mandatory safety and permit standards for OPS as well as net-zero-carbon fuel infrastructure. A goal-based technology-neutral approach is also no novelty in EU law, as the very successful example of the Sulphur Directive 2016/802 proves.

MUCH MORE THAN CARBON FOOTPRINT

Greening a whole economic system is a formidable task of evermore pressing importance. It will need constant & constructive input to succeed. For ports, the measures described above are the most imminent. However, the EDG’s focus is broader than CO₂ alone. Other aspects will

become relevant in the near future as well, including improving the energy efficiency of buildings, the condition of the water body and the soil, and the integration of biodiversity in the highly industrialised port areas. These will force ports not only to make considerable investments but to question and

ultimately re-establish the role they play in the greater scheme of things by seeking, testing, and putting in place new business models, most probably being much more open to incorporating practices from other industries – which we already see today. A generation’s defining task – for sure. ■

The challenges of disruption-free vaccine distribution

Photos: Canva

The biggest logistics project ever

by **Michael Yarwood**, *Managing Director Loss Prevention, TT Club*

Already on the front line and proven critical to the world's economy, performance in the global supply chain is now being catapulted into the public gaze like never before. While the uptake of COVID-19 vaccination programmes in several countries is high, many regions have yet to roll out vaccines at a similar rate. Some Southeast Asian countries such as Vietnam and Taiwan, where death rates were low during the first wave, are now suffering as vaccination rates are low across their populations. It is estimated that only 1.1% of the African population has been jabbed. At the end of June, it was reported that only 4% of people in India had received their vaccines. Necessarily, supplies and the distribution of COVID-19 vaccines will be ramped up significantly in the coming months.



TT Club specialises in the insurance of intermodal operators, non-vessel owning common carriers, freight forwarders, logistics operators, marine terminals, stevedores, port authorities and ship operators. The company also deals with claims, underwriting, risk management as well as actively works on increasing safety through the transport & logistics field. Please visit www.ttclub.com for more info.

It is hard to imagine a comparable product with a wider 'value' associated with the well-being of the global population, societal benefits and the impact on the global economy. As such, the distribution of COVID-19 vaccines has been labelled the 'biggest logistics project ever.'

Without the inevitable emotion attached to its distribution, one could argue that the vaccine is similar to any other valuable, sensitive cargo. The basics remain constant: identify the characteristics of the cargo to ensure its integrity is maintained; understand the location of manufacturing, delivery, routing and volumes, as well as value; then determine the appropriate strategies to adopt for safe and secure transport. Yet, there are considerable differences in distributing this particular freight – whichever vaccine is considered.

Risk at every juncture

Critical challenges exist in maintaining integrity in the temperature-controlled vaccine supply chain, including accurate

instructions and communications between stakeholders. Risks exist at every juncture, including packaging, packing, transport and unpacking. Such sensitive shipments will be vulnerable to the slightest error or discrepancy. Vaccines, specifically, are not just perishable but also subject to tight regulations concerning transport. Of particular relevance are the necessary controls regarding traceability and evidence of integrity throughout the journey.

The availability of transport equipment might be an interesting challenge in the current circumstances. Air freight capacity has remained tight throughout the pandemic despite increased passenger aircraft conversions to all-freight configurations. Sea freight might provide additional capacity. While it isn't a traditional mode of choice for such pharmaceutical goods, the nature of this particular supply chain and the fact that there will inevitably be various production batches suggests that sea freight could be a good fit. That said, the current troublesome accessibility



to containers in many regions of the world may restrict the attraction or feasibility of utilising the maritime mode.

There might also be the requirement to use reefers for some vaccine types. It may, however, be more difficult to increase the production of this specialist and costly equipment. Semi-active and passive solutions may be more readily scaled up to meet peak and ongoing demands.

Contamination risks will be amplified, given the sensitive nature of the cargo. Carrying equipment will need to be clean, clear of debris, free of visible pests, and controlled to ensure that previous loads will not lead to taint or odour. Ship stowage planning may also require increased attention.

Counterfeit rings

There have been many reported spikes in counterfeit medicines and related criminal activity across the globe. It may be anticipated that COVID-19 vaccines are a prime contender for counterfeiters to target. The heightened regulatory environment may only partially mitigate this risk for the transportation of these particular pharmaceutical products.

In a recent major operation, Europe's Interpol broke up global counterfeit rings, closing more than 100,000 bogus online pharmacies, making nearly 300 arrests and seizing more than \$20m worth of phoney items in the process. Mainly targeting counterfeit COVID-19 testing kits, this operation followed other examples. These have included discovering counterfeit networks in China and South Africa and producing fake vaccines from simple, widely available ingredients such as saline solution and mineral water.

Despite these law enforcement breakthroughs, the world's fight against the coronavirus pandemic has been further undermined by a booming trade in counterfeit personal protective equipment, COVID-19

testing kits, vaccine passports and other products, disrupting the preventative efforts and contributing to the spread of the virus.

In India, police reports speak of around 2,000 people injected with fake COVID-19 vaccines in Mumbai and another 500 in Kolkata – some of them disabled. Vaccination rates rose sharply in early July after the centre made shots free following

a devastating pandemic surge in April-May. Still, the rush to be jabbed allowed counterfeiters to benefit by supplying fake vaccines of saline solution. In Kolkata, police arrested a man posing as a civil servant with a master's degree in genetics who reportedly ran as many as eight spurious vaccination camps.

In the case of COVID-19 vaccines, as opposed to other high-value pharmaceuticals, only governments and multilateral agencies have access to the limited number of closely monitored suppliers meaning there is little room for so-called 'bad actors' to acquire genuine supplies. But the very tightness of supply allows these bad actors in the world of counterfeiting to exploit the imbalances in the supply of the vaccine and associated products against the enormous global demand.

Intensified security strategies

It is a near-perfect supply/demand situation to encourage counterfeit vaccines, which has not been helped by the expense of developing vaccines at a national level. There is a very high research and development cost behind producing a genuine product, making access difficult, especially for poorer countries. It has ultimately led to unequal global access to vaccines, with much of the world's supply being controlled by the most powerful countries.

In attempting to achieve some semblance of equanimity of distribution to poorer nations, and those not taking up vaccine orders early, national policymakers

will determine approvals and demographic priorities. However, realistic or not, widespread expectations will be that distribution and availability are immediate, or at least imminent. There will inevitably be those who fall outside of a defined demographic willing to pay for expedient access. Consequently, the black-market environment will likely continue for some time into the future.

Very early in this pandemic, items such as face masks and anti-bacterial hand gel became key targets for perpetrators of cargo crime. Unless distribution plans are perfectly executed within the expectations of any given population, which is unlikely, the vaccine supply chain will see a far greater multiplication of these threats.

The stakes could not be higher, far beyond theft or cybercrime; here, cybersecurity will need to defeat industrial espionage. Pharmaceutical regulations alone will be insufficient to support the necessary tracking, tracing and transparency through the end-to-end supply chain; intensified security strategies need to be developed and implemented. The menace of cybersecurity risks in this instance should put all on the highest alert. In general, freight crime rarely attracts media attention; it may be expected that the theft, loss or damage of COVID-19 vaccines would be front-page news.

The ultimate consignee

The scale of the logistical challenge can't be over-estimated. Many supply chains during the pandemic period have suffered stress and disruption, and there are regular reports of port congestion, shortage of containers, lack of reefer point capacity and strains on limited air cargo solutions. Significant volumes of the vaccine in need of distribution are to be anticipated well into the future. While some countries are considering local manufacturing and distribution, the logistics requirements are expected to stretch capacity and capability.

Distribution will eventually become global, necessitating careful planning and due diligence. While air freight is widely expected to support the primary movement of the vaccine, the global distribution requirement will necessitate substantial involvement from surface intermodal actors. The likely multiple transfers will require the most careful management of all aspects. The ultimate consignee in the context of the vaccine is, of course, you and me; delivery to a destination country or local region is not the end of the supply chain since final mile logistics involving truckers and temporary storage could prove complex. For the very final link in the supply chain, we will remain in debt to our medical professionals. ■



Key takeaways from Deloitte and ESPO's
Europe's Ports at the Crossroads of Transitions

New portscape

by Przemysław Myszka

The European Sea Ports Organisation (ESPO) has recently commissioned the consultancy Deloitte to report on the transformative impact of global trends and events on the European port industry, including the coronavirus pandemic, the green and digital (r)evolutions, the changing political environment, urbanisation, and demographics. “More than before, port managers will have to play their important role as matchmakers, facilitators and neutral partners in the modern port ecosystem,” Annaleena Mäkilä, ESPO’s Chair, underlined in the introduction to *Europe’s Ports at the Crossroads of Transitions*. It seems that the port sector will have to reinvent itself yet again. The ancients used to say: nothing new under the sun. Or is it?

the fundamental question is qualitative: will next-generation ports be, indeed, so much different from what we have got today? The report’s short answer would be: yes. Or rather: they should be to become a fitting match for a digital and green economy.

As such, Deloitte reached out to 55 senior port leaders and experts from across the EU to get a perspective on the industry’s prospects, with a particular emphasis on how the role of port authorities can change.

THE FOUR HORSEMEN OF CHANGE

According to Deloitte consultants, four overarching factors will reshape the port sector towards 2030 and beyond. First, the environment, which counts for adapting to the adverse effects of climate change and (co)developing greening solutions.

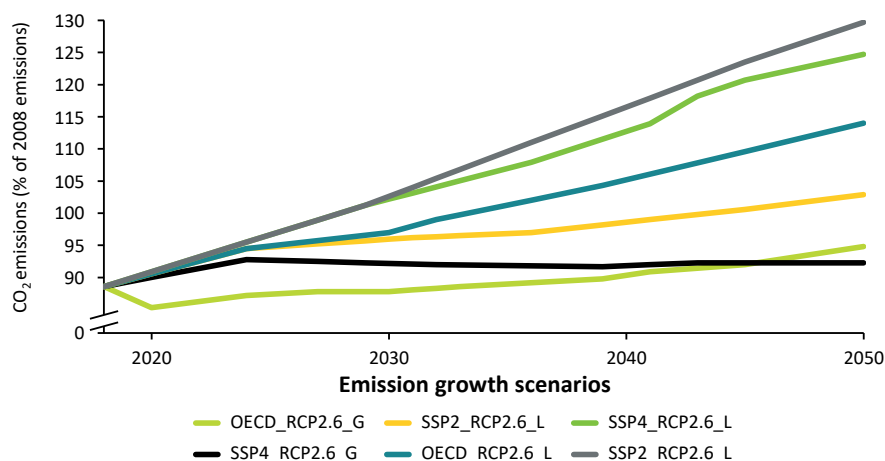
Second, technology, which will help ports to improve across a plethora of activity fields. Third, geopolitics and its power to either make or break trade that drives port volumes. Lastly, demographics influencing commerce and port-city relations.

ENVIRONMENT

Two-thirds of the interviewed authorities considered sustainability to be the no. 1 trend impacting their ports. Rising temperatures will affect the industry directly. The global mean sea level is expected to increase between 0.29 and 2.4 metres, making it necessary to

upgrade the existing infrastructure or replace it with a completely new one to cope with higher water. More frequent severe weather events will put pressure on the infrastructure, too (think of storms), and affect both people and machinery (heat waves, for example).

Fig. 1. Maritime shipping emission projections 2018-2050^{1, 2}

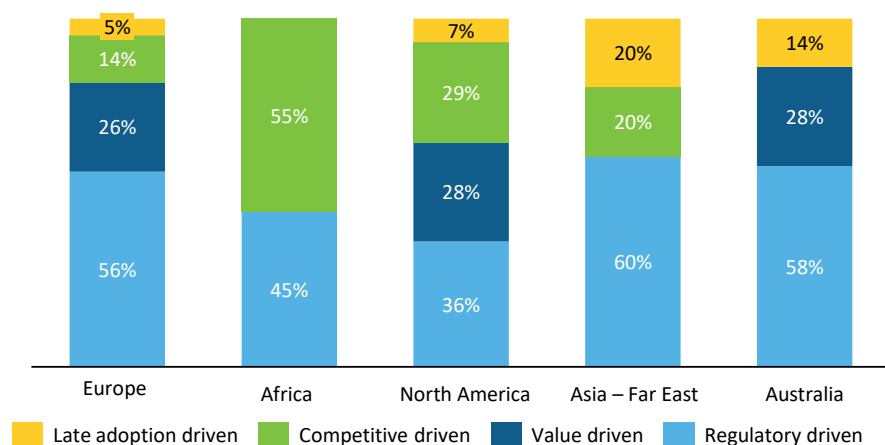


¹ Depending on the scenario, the share of maritime emissions (CO₂) as part of global emissions will either remain stable or grow by 40% by mid-century

² The scenarios originate from the International Maritime Organization's Fourth Greenhouse Gas Study 2020 and are based on GDP and population projections from the so-called Shared Socio-Economic Pathways (SSPs) developed by the Intergovernmental Panel on Climate Change, as well as the Organisation for Economic Co-operation and Development's long-term baseline projection (OECD 2018)

Source for all figs.: Deloitte and ESPO's Europe's Ports at the Crossroads of Transitions (2021)

Fig. 2. Driver of sustainability reporting¹



¹ Late adoption driven: similar practices that have been applied by successful actors within an industry. Competitive driven: following the drive to improve the level of operational efficiency. Value driven: internal values stemming from a uniformly trained pool of employees and consultants. Regulatory driven: resulting from formal and informal pressure from governments, or even from other stakeholders that influence an organisation, such as powerful customers.

TECHNOLOGY

Some 57% of interviewed parties considered technological innovation to be the no. 1 or 2 trend impacting their ports. In reality, the picture is a mixed one. On the one hand, a piece of port-tech news breaks now and then, e.g., about using Artificial Intelligence or digital twin for better port/terminal planning and maintenance. On the other hand, when one takes a step back and looks at the bigger picture, the individual news bits might get overshadowed by the fact that other seaports still haven't tapped into the digital revolution (and in the Baltic alone, we have got anything between 100 and 200 ports).

The latter stems from different reasons, among many, the lack of funds or tech-savvy personnel, or outright negligence ("the municipality will back up our business no

matter how deep the cargo volume dip," as heard behind-the-scenes during one regional port conference). Then again, several companies have made the small- and medium-sized ports their target market, rightly calculating that modern technology should be inclusive. There are also national authorities that push forward the port-shipping tech agenda thanks to EU funds.

On the flip side, there are also voices of enterprises engaged in aggressive marketing, concerned with selling whatever they've got on their shelves only, not caring about addressing the specific needs of their potential port clients. It seems that when a market matures, it inevitably also attracts scam artists.

The authors of the Deloitte-ESPO report strongly emphasise the development

The environmental factor also stands for the energy transition. According to ESPO's **Trends in EU Port Governance**, 25% of European ports have more than 50% of their traffic linked to energy commodities. As the EU's economy shifts away from fossil fuels, so will port cargo traffic (and revenue streams). Some enterprises may ultimately dwindle, like those handling crude oil or coal. Others, such as petrochemical companies, will need to change gear, exploring more and more boldly the use of renewables for producing electrofuels and P2Chemicals. According to another Deloitte study, conducted on behalf of the Flemish government's Agency for Innovation and Entrepreneurship, industries such as refineries, steel, iron, non-metallic minerals production, and chemicals emit almost 75% of the industrial emissions. "These industries will need to cut greenhouse gas emissions by 45-55% and improve energy efficiency with at least 32.5% by 2030," say Deloitte experts. As a result, they might as well find themselves turning into exporters one day rather than importers.

Synergies will be highly sought-after: governments and heavyweight energy companies investing in large-scale infrastructure for harvesting renewable energy, tech-firms developing innovative solutions for storing it and converting it into new fuel types, and port authorities providing the land so that supply and demand can meet each other in the most convenient place (for the shipping and trucking sectors to lower their carbon footprints).

The EU Green Deal, coupled with a generational shift in values, can have a profound effect on consumer patterns: less car ownership and flight-shame can translate into lower demand for fuel but higher for ferry traffic (necessitating good & green public mobility options to and from ports – by train, bus, or bike).

of port community systems (PCS) as a tool that can notably contribute to the authorities' role as matchmakers. PCSes can help ports become trusted and independent parties that handle sensitive data from competing parties to improve the performance of the whole logistics chain that goes through a given harbour.

And winning the trust and ensuring independence in taking care of data exchange are precisely the things that sometimes make implementing a PCS such a struggle. When asked during the latest World Ports Conference, organised by the International Association of Ports and Harbors, Masaharu Shinohara, Executive Officer of the Kobe-Osaka International Port Corporation, admitted that immense effort had been put into building

Fig. 3. Maturity of innovative solutions

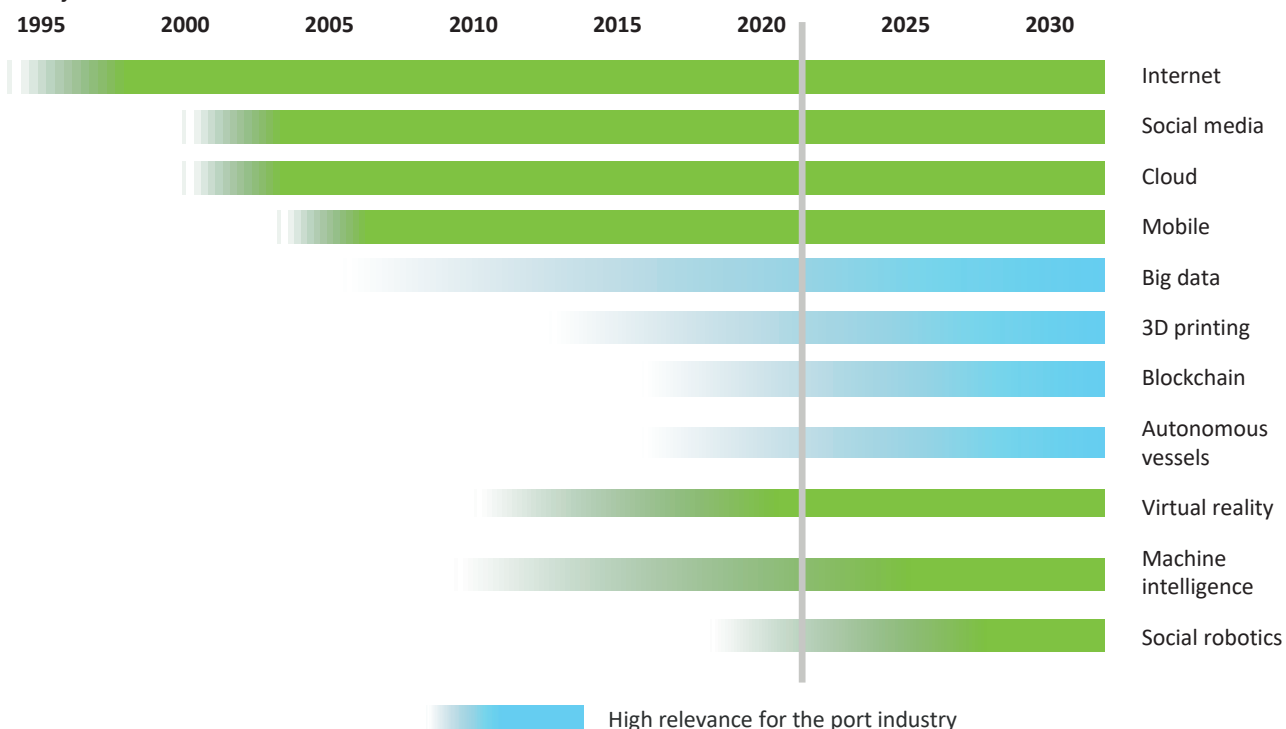







































Fig. 4. Impact of technology on ports and port trade


		Impact on trade flows				
		Impact on Ports				
		Impact	Primary resources	Manufactured goods	Services	Data
Digital platforms	E-commerce	++	-	▲	▲	▲
	Port community systems	+++	▲	▲	▲	▲
	IoT platforms	++	▲	▲	▲	▲
Logistics tech	Smart materials	+	▲	▲	-	-
	Autonomous vehicles	++	▲	▲	-	-
	Blockchain	++	-	-	▲	▲
	Cloud	++	-	-	▲	▲
Production alteration	3D printing	+++	-	▼	▲	▲
	Automated operations	+++	-	▲	-	-
	Virtual assistants	-	-	-	▼	▼
	Back office automation	+	-	-	▲	▲
New products	Renewable energy	+++	▼	-	-	-
	Electric vehicles	+	▼	▼	-	-

Fig. 5. Use cases of digital and innovation in ports based on Industry 4.0


		Use case (non exhaustive)	Example of use case in ports	Value generation
Connectivity	Internet of things	Sensorising of infrastructure and assets	Computer vision solutions e.g. smart harbour master systems	   
	Wearables	Tracking for safety and security	IoT and 5G applications for on terminal security	   
	Augmented reality	Virtual twin of infrastructure	Virtual twin of terminal/entire port	   
Big data	Optimisation and prediction	Optimisation of transport flows	Just-in-time port call optimisation & port community systems	   
	Machine learning	Self improving algorithms	Addition to other use cases	   
	Cyber security	Preventive cyber units	Port wide cyber prevention and response teams	   
Advanced manufacturing	Additive manufacturing	3D printing for parts and commodities	3D printing of spare parts for port assets	   
	Advanced materials	High tensile materials, smart materials	New materials for quay/flood wall	   
	Robotics	Automation of processes	Automation of port processes (e.g. locks) and terminals	   




Increased efficiency, reliability and transparency through platforms



Improving environmental performance



Increased efficiency and transparency through automation



Improving safety and security

trust among the stakeholders to convince them that sharing data will benefit all involved. However, there might be structural difficulties in setting up a PCS, e.g., when the port authority is involved in stevedoring itself. As it often does,

a lot will depend on culture, but even in such a collective and orderly society as Japan, developing a data exchange platform wasn't a task one could easily breeze through. I also remember listening to Richard Morton from the International Port Community Systems Association, who said that we could head towards integrated regional PCSes at best. As things stand today, a global system is virtually impossible to set up (or, at least, the costs of getting it online would outweigh the benefits).

That said, *Europe's Ports at the Crossroads of Transitions* reads that the sharp increase in e-commerce brought about by the coronavirus pandemic will necessitate greater transparency across

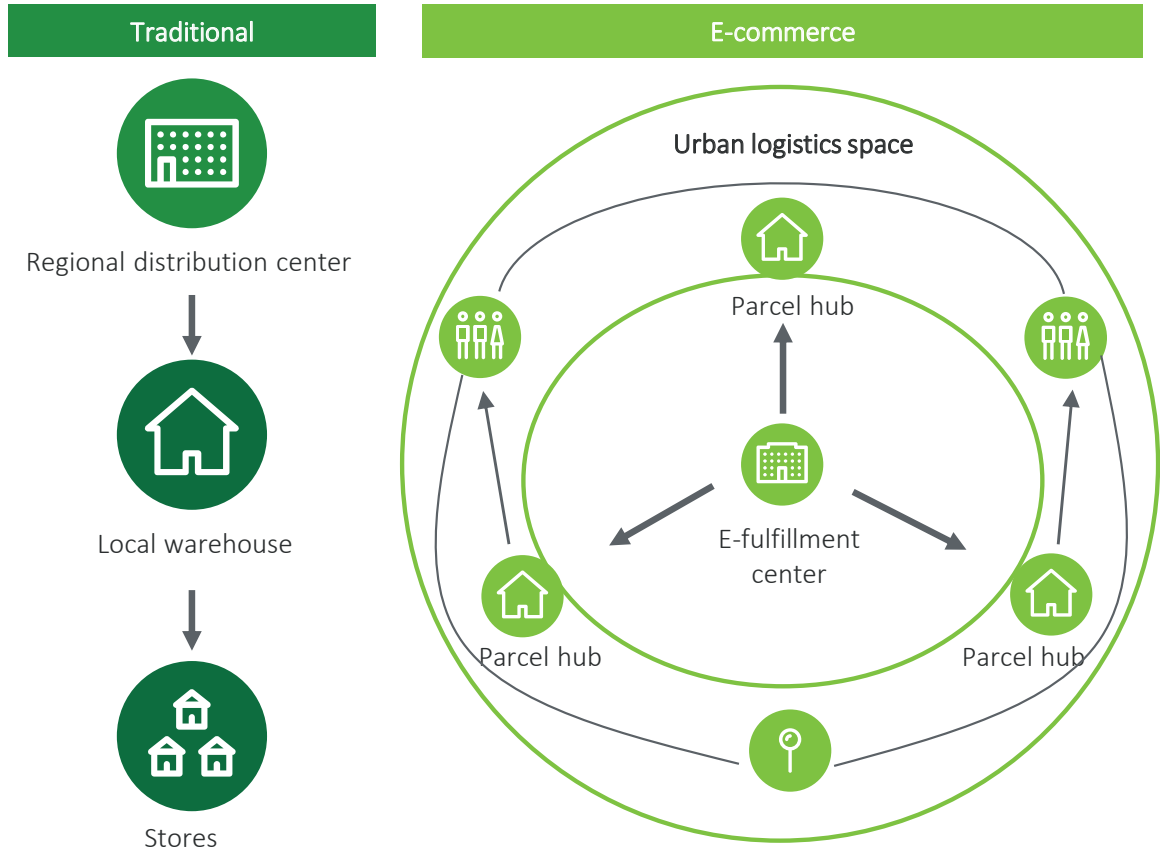
the supply chain as these (often high value) consignments are more time-sensitive than your usual container shipments. In this regard, the Deloitte-ESPO report brings forth findings from an **e-commerce study by SearchNode**. According to these, during the 2020 summer season, when the lockdowns were less strict, 92% of the respondents still experienced a growth in their online revenues; 57% indicated the pandemic imposes challenges because of

a disrupted supply chain, and 43% pointed to challenges regarding fulfilling the demand for products. Deloitte-ESPO authors further, "The pandemic accelerated the expansion of e-commerce towards new firms, customers (e.g., elderly) and types of products (e.g., groceries and everyday necessities). A global consumer survey measuring the adoption of digital and low-touch activities suggests that new users drove over 50% of the increase in online grocery shopping,

pick-up from restaurants or other stores." In conclusion, they say, "[...] this shift is likely to stick post-pandemic."

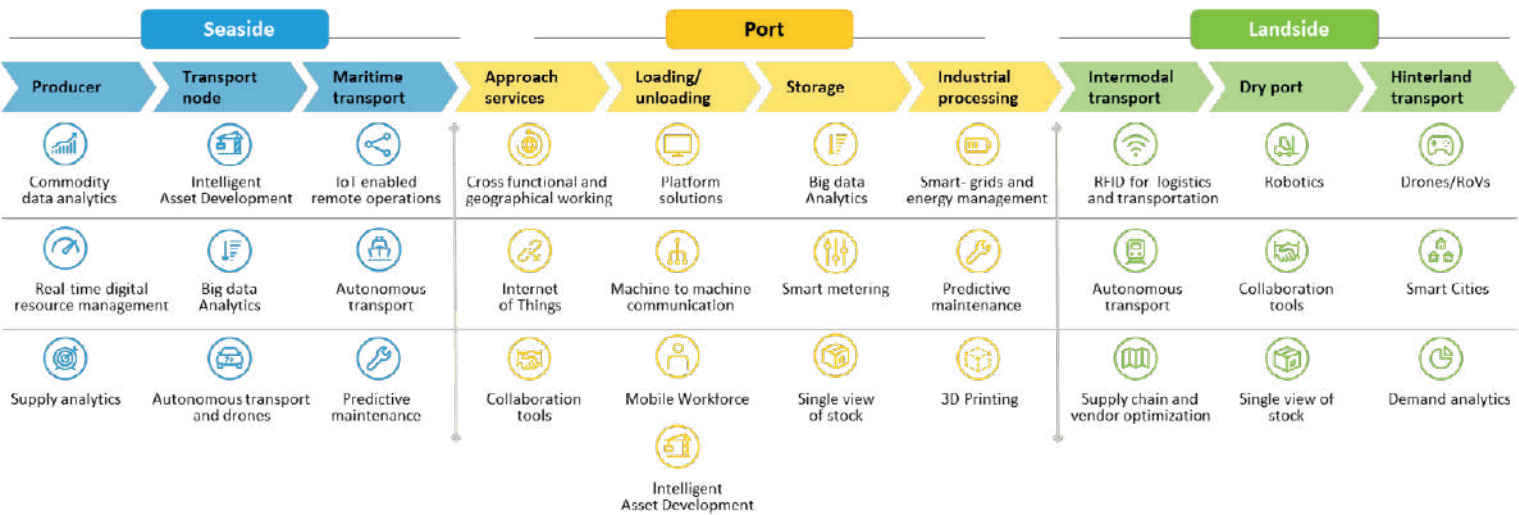
Technological developments, of course, promise a broad range of improvements to daily and strategic port operations. To name but a few that have already proven their worth in the Baltic: automated mooring increases the speed of ships berthing and clawing away; on-shore power supply decreases at berth particle emissions and noise pollution; digital twins make maintenance work easier; drones help to monitor emissions, take care of security, and make high altitude maintenance safer; software optimising vessel arrivals streamlines port traffic and berth usage; training centres ready new employees to work with remotely operated cargo handling equipment (including groups traditionally excluded from heavy-duty on-site work, like women or people with mobility impairments).

Fig. 6. The e-commerce supply chain¹



¹ Where shipping firms, logistics providers and terminal operators are pursuing as much scale and mass as possible. Consumers increasingly expect faster and more flexible services for the delivery of goods. Ports will have to manoeuvre between a changing demand and supply side, where they need to serve both "customers." This leads to a push for more storage and buffering capacity in the port area.

Fig. 7. Technological innovation in and around the port ecosystem



GEOPOLITICS

The Deloitte-ESPO report lists globalisation vs protectionism as the main geopolitical barrier to increasing trade, hence more significant volumes going over port quays. For instance, the authors underline that some 56 new trade-restrictive measures (tariff increases, import bans, export duties, and stricter export customs procedures), not related to the coronavirus

pandemic, were implemented globally mid-October 2019-to-mid-May 2020. They also quote the World Trade Organization, which estimates the cumulative trade coverage of import-restrictive measures implemented since 2009 – and still in force today – amounts to 8.7% of world imports. “This trend has grown steadily since 2009, and the increase in protectionism has led to

a notable decline in global trade growth,” *Europe’s Ports at the Crossroads of Transitions* adds. One of the signs of deglobalisation is the decreasing ratio of global trade to GDP since 2010. On a positive note, however, the EU has been able to counter this trend. Here trade (intra- and extra-EU) as a share of GDP was higher in

2019 than in 2008. “Calculations based on bilateral trade data show that intra-EU trade/GDP continued to grow, while extra-EU trade as a share of GDP fell from 2012 to 2016 but increased afterwards. Therefore, the fall from 2012 to 2016 in the global trade/GDP ratio originates from developments in non-EU countries,” Deloitte experts argue.

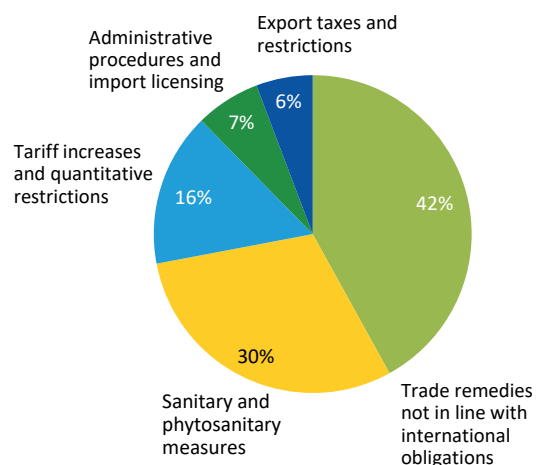
Staying in Europe, the publication also puts Brexit in the limelight, specifically, giving eight UK ports the ‘Freeport’ label, which makes them an area exempt from customs duties and tariffs. The move by Boris Johnson’s cabinet is supported by the view that freeports can attract businesses and jobs to locations that would otherwise struggle. This is countered by the report’s authors who say, “Assuming a stable market, they [freeports] do not boost employment or trade growth overall, they just move economic activity from one place to another – a zero sum game, potentially from the EU to the UK mainland.” Naming certain port-related activities “footloose,” such as HQs of maritime firms or water-bound production plants, they warn against them moving to the UK, not creating any added value for the entire industry, just clipping some of their costs at the expense of the national budget. The report also highlights

Brexit’s immediate trade impact: a decrease of 29% and 41% for imports and exports from/to the EU, respectively, in January.

The publication also mentions the Arctic. The northernmost ocean is expected to be summer-ice-free as early as 2040, making it easier to get at the world’s 13% and 30% of undiscovered oil and gas, plus uranium, rare earth minerals, and fish stocks.

China’s rising overseas involvement is also touched upon, primarily in the context of seizing critical assets like transport infrastructure. The question is whether it’s a legitimate concern or anti-Chinese sentiment. Taking over the port authority of the Greek Piraeus, with the EU’s consent, appears to be an isolated example that took place in extraordinary circumstances, not likely to be mimicked in the foreseeable future. Under the rule of COSCO, Piraeus has grown into one of Europe’s container heavyweights. Nevertheless, thereby hangs

a tale, **as I wrote in a separate piece on the EU’s increasingly assertive stance against China.** Then again,



¹ On a European level, 438 active trade and investment barriers in 58 third countries were present in 2019. This indicates that protectionism is becoming structurally ingrained in EU’s trade relations with many partners. In 2019, for the first time, border measures (52%) took up the largest share, followed by behind-the-border measures (43%). From the newly added trade measures in 2019, 65% consisted of border measures.

politics aside, authors of the Deloitte-ESPO report note, “In 2020, China temporarily became, by replacing the US, EU’s greatest trading and investment partner.” It also reminds the times, a couple of decades ago, when people in the US feared that the Japanese will take over the country (Japan is still the US’ biggest lender, but China is the one on the firing line nowadays).

DEMOGRAPHICS

Authors of *Europe’s Ports at the Crossroads of Transitions* remind, “The rise and fall of major maritime centres has been historically linked to population growth (growing demand), population distribution (demand concentration) and imbalance (shifting demand and supply costs).” They, however, further, “Over the next ten years, a strong growth in port volumes coming from pure demographic growth should not be expected in the EU.” It appears that two things stand behind it. Europe’s population is getting older, and, in the words of the World Economic Forum, “**Millennials will be the first generation to earn less than their parents,**” and that “**Millennials have it worse than any other generation.**” Trends such as minimalism and low- or zero-waste can put their two pennyworth, too, to a long-lasting decrease in consumption (or, at least, a profound shift from owning to sharing/ subscribing products and services).

That said, demographics will fuel another trend impacting ports, namely **urban development**. It isn’t an ‘if’ issue – the EU’s level of urbanisation is anticipated to increase to 83.7% in 2050, reads the Deloitte-ESPO report. Tackled

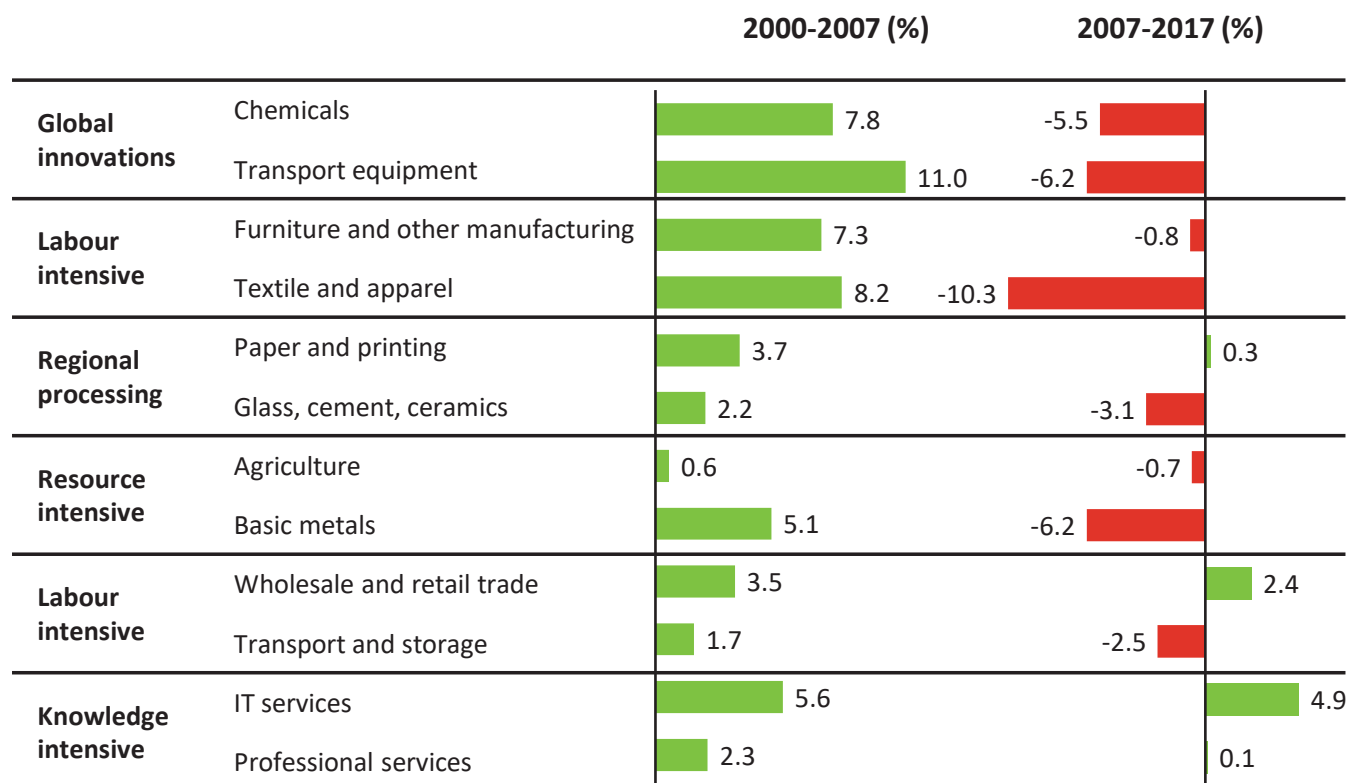
incorrectly, it can boil over into urban sprawl, creating an array of difficulties – with lack of proper housing, inadequate provision of public services, or impaired mobility. With trucks heading to and from the port and vans trying to deliver all those time-sensitive e-commerce parcels, city logistics can become a growing nightmare should more people decide to own more cars (and ride them alone).

There is also the allure of living by the waterfront, partly driven by aesthetics but also as a confirmation of one’s social status (read: wallet size). As such, there is an evident tension between cities and their ports. The tricky part is to have the best of two worlds – efficient cargo and passenger serving ports and attractive space for urban development. It takes two to tango, with both parties understanding each other’s needs. On the one hand, ports are often one of the biggest economic powerhouses in and around the city (if not the largest), providing revenue and generating jobs. On the other hand, they can also be one of the central sources of, e.g., pollution or traffic congestion. Even though they aren’t the ones who drive the ships and trucks, the negative glare of public scrutiny often

falls on them for the nuisances caused by port externalities. Ports are also dependent on their cities as markets and employee pools. Having stars in their eyes, local and central governments can rely on future ports as drivers of decarbonisation by supporting such initiatives as coupling offshore wind energy farms with hydrogen production to offer low/zero-carbon fuels for shipping and overland transport. “The main goal of this external cooperation is often to leverage on external knowledge or de-risk certain events and investments.”

Looking at the numbers, it will be one of the most significant challenges of our times. “Given the (current) low production capacity (less than 2% of the energy mix) of hydrogen in European ports, resilient and safe transport chains need to be established to import industrial use volumes.” The same holds for the carbon capture & storage and carbon capture utilisation technologies – ever promising to get that CO₂ from industries and pump it into depleted gas fields in the North Sea or off the Norwegian coast. However, giving the devil his due, two ports in our corner of the world, **Copenhagen** and **Gothenburg**, have lately

Fig. 9. Changes in trade intensity as share of gross output¹



¹ Trade intensity (the ratio of gross exports to gross output) in almost all goods-producing value chains has fallen between 2007 and 2017. Trade is still growing in absolute terms, but the share of output moving across the world's borders has fallen from 28.1% in 2007 to 22.5% in 2017.

Fig. 10. Maritime industry perspective on alternative fuels

Fuel	Part of future mix? (% participants)	Engine type	View on technology maturity	View on applicability to shipping	Advantages	Disadvantages
Green Hydrogen	65%	Combustion	Medium	Medium	Cross-sector applications – possibly faster R&D	Cost Relatively low energy density Cryogenic storage conditions Need for renewable electricity Inefficiency in conversion/production
		Electric (fuel cell)	Low	High	Less space for engine and better specs than combustion	
Green Ammonia	55%	Combustion	Medium	High	Relatively high energy density Already developed experience	Cost Toxicity
		Electric (fuel cell)	Low	High	Less space for engine and better specs than combustion	
Biofuels	10%	Combustion	High	Low	Easy to implement in current engines	Limited feedstock, unlikely to be available, large difference between types of biofuels, difficult to check compliance
Methanol	10%	Combustion	Rarely mentioned	Rarely mentioned		
Batteries	< 5%	Electric	High	Medium (ship size dependent)	Mature technology	Extremely low energy density Size and weight of batteries
Nuclear	< 5%	Heat	Medium	Low	Mature technology	Very high investment, social aversion, rarely mentioned by decisionmakers

become part of cross-industry ventures to do precisely that.

Currently, the two most widely taken approaches to relieving port-city pressure points are tweaking port operations using modern technologies or setting up a terminal/harbour/port from scratch (not too close yet not too far from the settlement). The first is used for, e.g., streamlining cargo flows to and from ferry and ro-ro terminals. It's widely

acknowledged that adding road capacity is a dead end, as traffic jams easily swallow the extra carriageway. The alternative is to optimise the flow itself, chiefly by advising truck drivers on when exactly they should arrive at the, hopefully, automated gate. The decision to move harbour activities entirely is also made to improve the port's competitive position through longer and deeper quays and better hinterland connectivity. The Baltic

Sea region saw several such greenfield projects coming to fruition over the past couple of years, with others already in the pipeline.

As is the case with the environmental and technological factors influencing each other, the same happens with demographics. According to UN Migration Agency's projections, more than 100m people will live in areas where the average heat in the hottest month is likely to be too high for

Fig. 12. Modal split of EU's external and internal trade

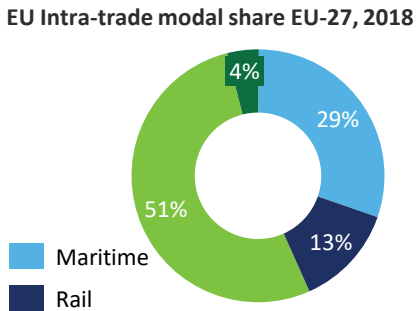
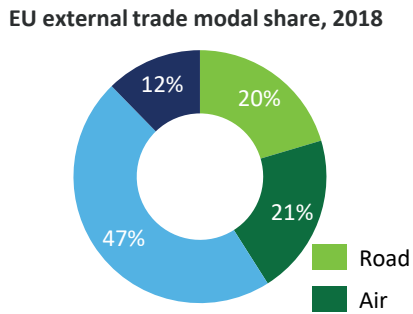


Fig. 11. Energy from renewable sources used in transport in the EU-28, and Iceland, Norway and Turkey (%)

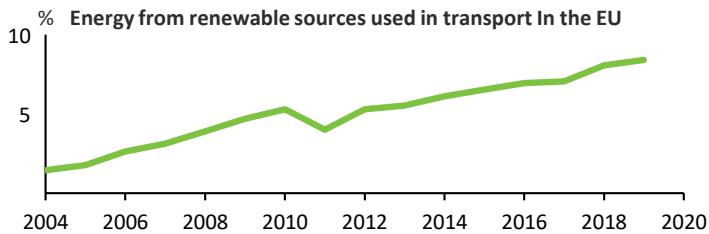


Fig. 13. Benefits generated by modern ports (non-exhaustive)

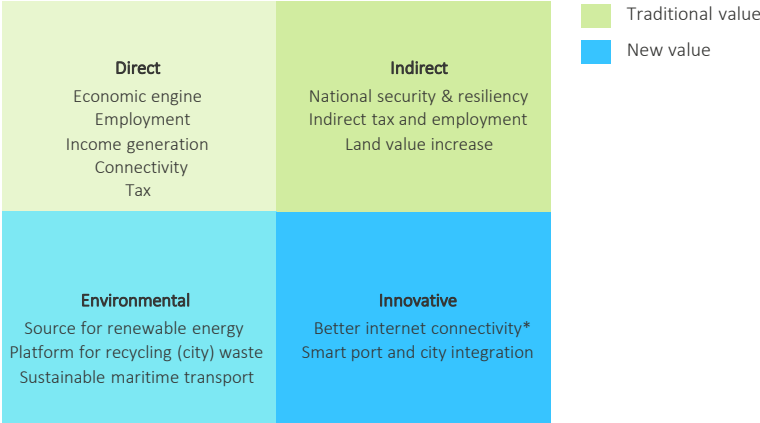


Fig. 14. Port environment, stakeholders, and interests



a human body to function well in the case of a temperature rise of two centigrade. In

conjunction with political unrest, it might force people to move northbound to search

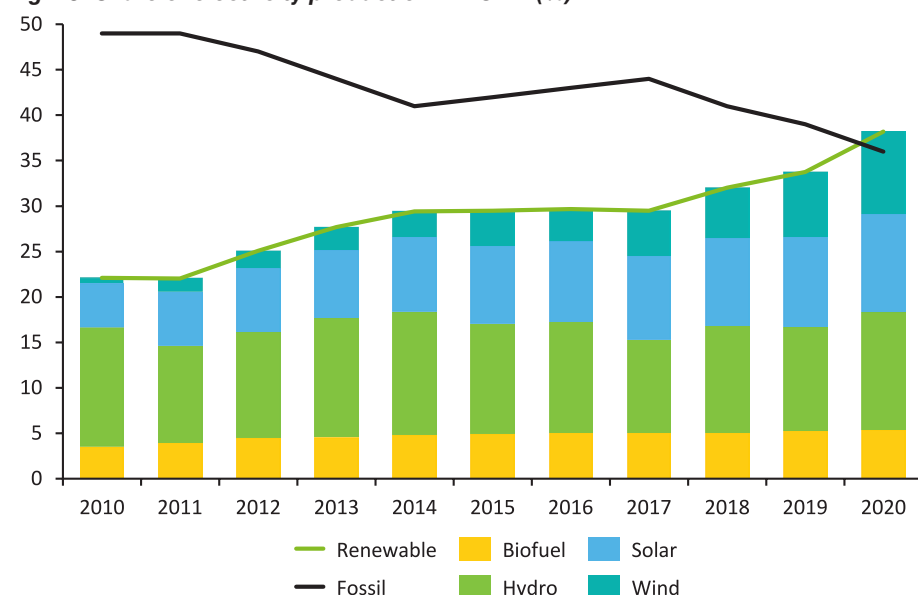
for liveable conditions – either in port-cities themselves or through them.

POST-CORONA

Authors of *Europe's Ports at the Crossroads of Transitions* state, "Because the EU, compared to other areas worldwide, remained in a relatively strong economic health despite the COVID-19 pandemic, it is now in a good position to continue the energy transition." We are talking about 1.8tr of money to boost the recovery. The message is also clear: those funds are to be used for making Europe's economy (digitally) greener and overall more resilient.

"Even during the COVID-19 pandemic, investors continued to show interest in greener companies while showing less interest in carbon-heavy incumbents," reads the Deloitte-ESPO report in this context. It also reminds us that in the crisis years of 2007-2009, the EU invested 565m into the offshore wind energy industry, plus some 25b in feed-in tariffs to make electricity it produces more economically viable. As a result, renewable energy sources overtook fossil in 2020 in electricity generation for the first time in the EU's history. Yet, "While greening, digitalisation and growth are the clear priorities put forward for the national recovery plans, the national implementation very much differs both in terms of the size of the envelope and the way it will be spent, more in particular as regards investments for infrastructure and greening of transport. Different EU Member States have no port projects included at all." On the contrary, even such up-to-date fossil diehard countries like Poland are finally getting involved in not only erecting their offshore wind farms but also announcing **far-reaching plans of using energy from them to supply green**

Fig. 15. Share of electricity production in EU-27 (%)



hydrogen throughout Central Europe, including for the needs of the transportation sector.

The EU intends to tackle their Member States' imported greenhouse gas emissions, too. For instance, the Stockholm Environment Institute released in 2018 the two-piece series *Att se hela bilden* (*Seeing the Whole Picture*), in which it attempted to factor in the carbon footprint Swedes generate both domestically and abroad. While the former is all sunshine and rainbows, as one could expect, the latter unveils a considerably darker image. With the **Carbon Border**

Adjustment Mechanism, the European Commission will place a carbon price on imports from less climate-ambitious economies. "As the EU is determined to become carbon neutral in 2050 and maintains the highest environmental and climate protection goals in the world, it wants to implement such an instrument in order to raise the global climate ambitions of EU trading partners, to preserve global competitiveness of EU companies and to prevent the relocation of EU industry to countries with less ambitious emissions rules (carbon leakage)," Deloitte experts analyse.

THE EUROPEAN PORT OF THE FUTURE

The title is slightly misleading because not all ports are created equal. Port authorities also differ – from landlords to part-stewards, and from state-, municipality-,

industry-, private-, or even pension fund-owned. Then again, the authors of *Europe's Ports at the Crossroads of Transitions* tell us that the same trends will influence even

such contrasting seaports as Rotterdam and Saarte Liinid.

The future port will be a green and digital facilitator of innovation and

Fig. 16. Estimated impact of trends on different types of ports

● Strongest effect ○ No effect

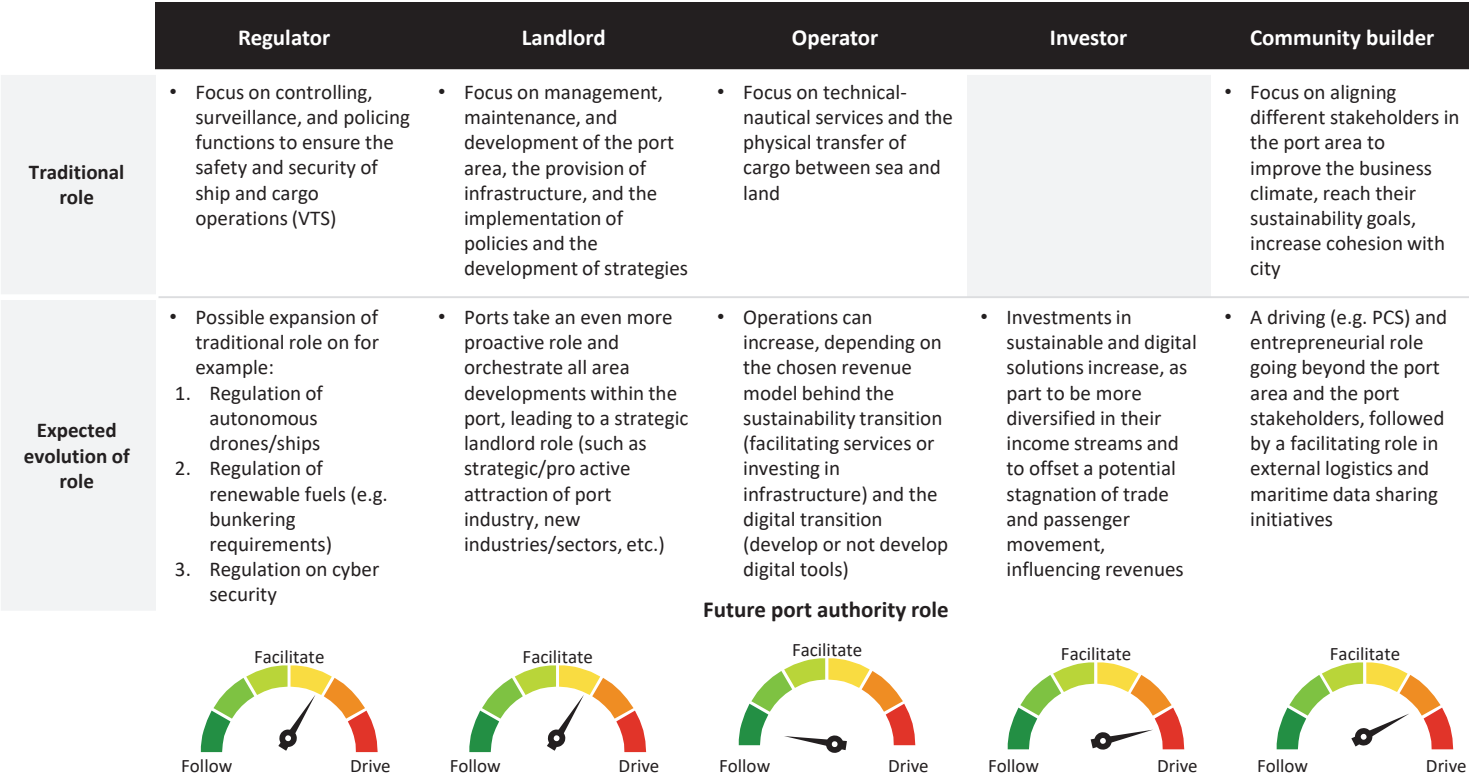
		Larger ports	Smaller ports	More industrialised ports	Less industrialised ports	Urban ports	Capability match of traditional governance
Increased focus on sustainability		●	●	●	●	●	Low
Increased focus on innovation		●	●	●	●	●	Low
Shifting trade developments	Near-shoring	●	●	●	●	●	High
	Alternative trade routes	●	●	●	●	●	High
	Supply chain integration	●	●	●	●	●	Medium
	Security	●	●	●	●	●	Medium
Increased community awareness		●	●	●	●	●	High

cooperation, providing a neutral platform for all parties along the logistics chain to up their performance. Filling those shoes will require plenty of investments in hard- and software infrastructure as well as in people. A great deal

of it will be done with the helping hand of local, state and international agendas, and other industries that need to green their credentials to win back the heart of sustainably oriented societies, activists and politicians.

In the more or less distant future, we may as well witness the fall and demise of the ‘traditional’ port model, focused on cargo and passenger volumes. Ports as clean energy generators and tech-breakthrough accelerators? Perhaps. ■

Fig. 17. Evolution and development of port authority roles



YOUR PORT

JUST ONE CLICK AWAY.

PORTOFHAMBURG.COM

Port of Hamburg Marketing
 Pickhuben 6, 20457 Hamburg, Germany
 Phone: +49 40 377 09-0
 E-Mail: info@hafen-hamburg.de

in
PORTOFHAMBURG

f
HAFENHAMBURG

@
PORTOFHAMBURG

✉
PORTOFHAMBURG

Port of Hamburg



Trade liberalisation to the post-COVID rescue

by Ewa Kocharńska

Protectionism in Maritime Economies Study from the International Chamber of Shipping (ICS) examines the relationship between restrictive maritime trade policies and economic growth. In its results, the study discusses the benefits countries would reap, such as a 3.4% increase in GDP, if protectionist policies in trade were to be reduced or dismissed. The analysis illustrates how in the age of trade wars among the most powerful nations, together with disruptors like Brexit, COVID-19, and unexpected political outcomes, protectionism, anti-trade rhetoric, and misguided nationalism can easily become weapons of self-harm.

While the COVID-19 pandemic has been detrimental to most industries, seaborne trade faces additional roadblocks on the way to full recovery. A significant barrier in shipping is that governments' commitments on maritime services are not codified by the World Trade Organisation's General Agreement on Trade in Services (**WTO GATS**). Therefore, shipping is more susceptible than other industries to governmental protectionism and restrictions, slowing down economic progress.

According to many experts, the WTO's maintenance of trade liberalisation process after the financial crisis of 2008 played a vital role in the recovery of the global economy. For that reason, ICS hopes that this study will encourage "a serious discussion about resuming the WTO GATS negotiations with a particular focus on concluding

a multilateral agreement on maritime transport services."

Throughout the study, the authors emphasise the importance of multilateral trade agreements, as the results of their analysis show all nations benefiting from such an approach and all at a profound disadvantage if some actors don't participate – low- and middle-income countries in particular.

Ready for prime gains

The analysis, which used data from the WTO, the Organisation for Economic Co-operation and Development (OECD) and the World Bank, among others, is based on a Protectionism in Maritime Economies (PRIME) Index and a corresponding PRIME score of each country, a tool developed especially for the study.

The PRIME Index calculations are comprised of five categories – entry and

PRIME Index Categories and Subcategories

A. Entry and Licensing

1. Conditions on Market Entry in the Maritime Freight Transportation Sector
2. Conditions to Own and Register Vessels under the National Flag
3. Conditions on Licensing, Investment Screening, and Qualifications Relating to Market Entry

B. Management and Employment

4. Conditions on Management and Employment in the Maritime Freight Transportation Industry
5. Quantitative Measures Affecting the Movement of Persons in the Maritime Freight Transportation Industry

C. Operation and Competition

6. Conditions on Supply of Services in the Maritime Freight Transportation Industry
7. Government Procurement Measures in the Maritime Freight Transportation Industry
8. Regulations, Taxes and Fees in the Maritime Freight Transportation Industry
9. Government Involvement in the Maritime Freight Transportation Industry

D. Tariffs and Trade Agreements

10. Tariffs and Trade Agreements
11. Commitments in World Trade Organization Agreements

E. Government Efficiency and Integrity

12. Efficiency of Countries' Processing of Exports and Imports (Raw Values)
13. Efficiency of Countries' Processing of Exports and Imports (Index Values)
14. Measures of Governance

licensing; management and employment; operation and competition; tariffs and trade agreements; government efficiency and integrity. According to some of each country's current maritime trade policies, out of 58 examined nations, 46 were assigned a PRIME score (from 0-100, where 100 is the worst score). With that information, the study explores the economic gains in case the trade restrictions were changed or lifted, hypothetically cutting the nations' PRIME scores (level of restrictiveness) in four different scenarios.

Key findings show that all countries would benefit even in the least favourable circumstances as long as the governments loosened or removed at least some of their trade restrictions. In Scenario 1, where all studied countries would cut their PRIME score by 50%, total exports of goods and services would rise by 21% on average, corresponding to a GDP increase of 1.1% in general (from the 0.3-3.4% range). In Scenario 2, where all countries cut their PRIME score by 10%, average GDP gains for most countries are from 0.1% to 0.3% (and 0.4% to 0.6% for a few states). In Scenario 3, where high-income countries cut their PRIME score by 10% and others by 5%, the benefits would be smaller, particularly for the low- and middle-income economies. "Any decision to cut the PRIME score to

a less ambitious degree amounts, in effect, to low- and middle-income

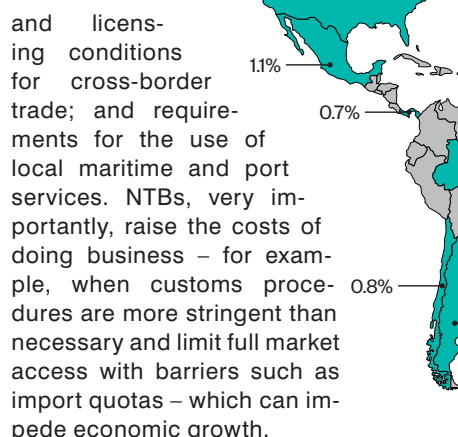
nations denying themselves a greater degree of economic benefit." In Scenario 4, where all countries cut their PRIME score on tariffs and agreements by 10% with improvements resulting from commitments in trade agreements only, without addressing issues such as government efficiency or market entry and licensing, the gains are much smaller – only about 25% of the gains in Scenario 2. "If countries limit their reforms to what might be gained from trade negotiations only, they will leave most of the potential gains on the table."

One of the most significant outcomes of the analysis is that low- and medium-income economies would see the biggest payoff from a global agreement to less restrictive trade policies. Gains for low- and medium-income countries would be decidedly higher under Scenario 2 (all nations cutting PRIME score by 10%) than under Scenario 3 (high-income countries cut their PRIME score by 10%, other countries by 5%). For high-income economies, the difference between the two scenarios would be minimal. The study concludes that countries that receive "preferential treatment" – that is, they don't cut their PRIME score as much as others, are putting themselves at a disadvantage, passing on opportunities to eliminate policies that discourage investments and suppress economic growth.

However, all participants would benefit from a reduction in maritime protectionism and liberalisation of trade policies irrespective of their economic development level, and even if they do it unilaterally in case of a failure in global consensus. "While liberalisation in one country may be second best to global reform, it is greatly preferable to no reform at all." It would also be of great disadvantage for any nation to pursue lesser reforms than its trading partners. The data reveals that everyone benefits if all countries limit their trade barriers. However, if nations act unilaterally, their economies benefit as long as the governments take steps to open up their markets to fair competition.

Furthermore, the findings suggest that concentrating on just traditional tariffs in trade reform considerations and negotiations is counterproductive since economies gain most by removing non-tariff barriers (NTBs). The trade costs of these, such as quotas, sanctions, or import/export controls, are significantly higher than standard tariffs. The most common trade policies that impede maritime trade growth considered in the study are numerical and non-numerical limits on the extent of maritime services provided through cross-border trade; entry

Source for all figs.: ICS/Craig Van Grasstek, Protectionism in Maritime Economies Study (2021)



incomes and lower corruption levels. In contrast, countries with high trade costs tend to have weaker and more corrupted governments. Therefore, reducing trade

barriers must go together with improvements in the quality of governance to see an increase in income levels and economic competitiveness.

Fig. 3. Gains from liberalisation under Scenarios 2 and 4 using percentage changes over the 2015 baseline GDP level

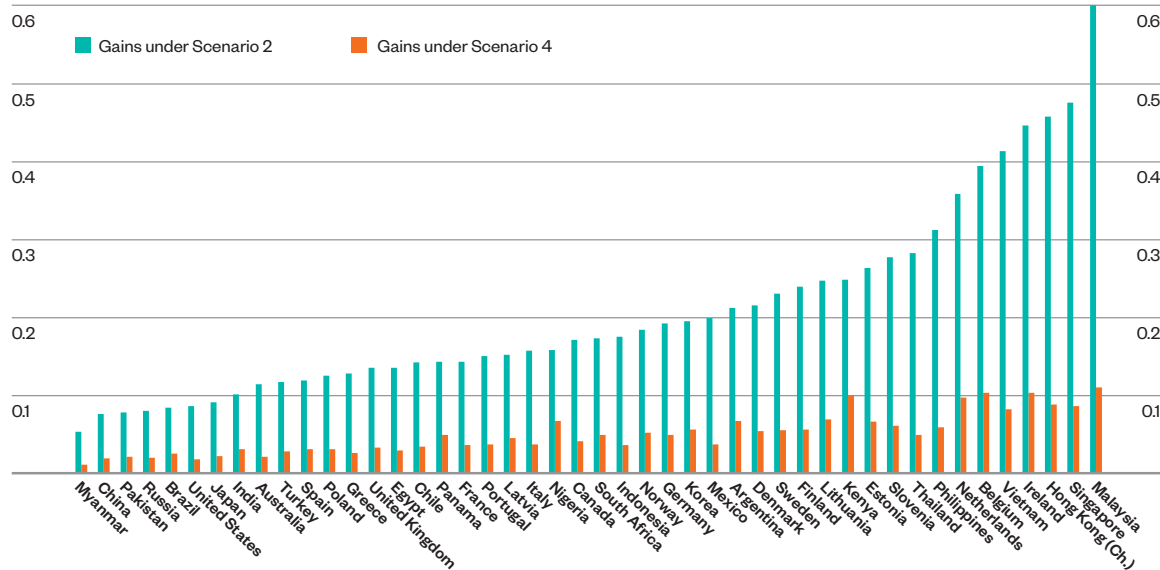


Fig. 4. Gains for low- and middle-income countries from liberalisation under Scenarios 2, 3, and 4

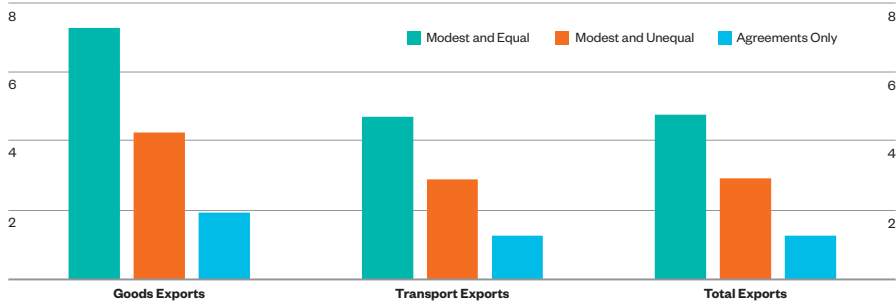


Fig. 5. Gains for high-income countries from liberalisation under Scenarios 2, 3, and 4



Deliberate protectionist purposes

According to the report, governments don't recognise how crucial maritime transport is in trade negotiations. "This may be due to a lack of appreciation by countries of the strategic importance of maintaining competitive and cost-efficient maritime supply chains for the benefit of their national economies." After all, maritime transport handles over 80% of the global merchandise trade. The coronavirus pandemic has undoubtedly underscored the importance of shipping in supply chains worldwide (though the public eye is still very much stone-blind to this, preferring to focus on the negatives like the Suez Canal blockade). In response to the coronavirus

outbreak, by 24 April 2020, more than 80 countries or territories had imposed some additional export restrictions. That alone caused a decline in the supply of manufactured goods globally, but coupled with labour shortages at ports, the movement of goods slowed down in the second quarter of 2020 faster and to a greater extent than ever before in such a short period.

Moreover, the authors state that recently, maritime trade restrictions are on the rise, varying greatly from country to country, and have been imposed for "deliberate protectionist purposes." Often, these restrictions take the form of NTBs instead of traditional tariffs. NTBs have proven to be the most fundamental obstacle to trade in developed economies that already have low tariffs. The study found them to be ineffective weapons in trade disputes and damaging to countries' economies that impose them.

Trade protectionism can be seductive because tariffs increase the government's immediate revenues; such policies can be used to promote domestic production, increase employment opportunities, and raise wages. On the other hand, local companies and customers can be negatively affected by trade restrictions due to, among other things, a decrease in international competitiveness, fewer product choices, and higher prices. Further, even though some jobs can be saved through protectionist trade measures, other industries must cope with corresponding job losses because higher prices translate to lower demand and output. And while federal revenues can indeed increase as a result of tariffs, they are often offset by, for example, lower tax collections from corporations and payroll along with numerous other adverse economic outcomes.

Unquestionably, in recent years, powerful nations have increasingly started using their trade policies as weapons and tools of retribution, which is exemplified by the trade war between the US and China, continuing since 2018. The two countries had imposed tariffs on one another's goods for reasons debated globally for quite some time now. The US and other nations accuse China of intellectual property theft and unfair trading practices. At the same time, China claims that the Americans are trying to stop the state from becoming the global economic leader.

Perfectly illustrating how trade policy can be used as an effective political tool, in 2016, then-presidential candidate Donald Trump built his campaign around blaming China for the loss of manufacturing jobs in the US. He criticised China's unfair trade practices and accused the country of engaging in "the greatest theft in the history of the world." He promised to put China in its place and force companies to return manufacturing jobs to the US. Trump's political instincts were correct – he sensed the frustration of American factory workers and farmers who felt that the political elites were ignoring their concerns. For that reason, it was some of the manufacturing-dependent regions of the US, such as Wisconsin and Michigan, that on the election day have unexpectedly flipped for the Republican candidate, putting Trump in office.

The 45th US president stayed true to his word, the trade war began, and the reality hit. The higher import tariffs serve primarily as a sales tax which increases costs for average consumers. The uncertainty accompanying the trade disputes has led to global trade diverting away from the US and China and slowing down manufacturing, investments, and global economic growth. The US manufacturing plants have been affected by the weaker overseas markets and an uncertain investment outlook. Factory employment started falling partly due to Trump's steel and aluminium tariffs, which were meant to protect domestic producers from unfair competition. Yet, as a side effect, those measures also disrupted supply chains, leaving industrial companies without materials but with skyrocketing price points for steel and resin. US farmers, meanwhile, lost the majority of the \$24b Chinese market due to retaliatory tariffs from China.

Trump ended up losing his re-election when the same regions that pushed him over the edge in 2016 voted for his opponent. And, perhaps in another lesson on trade disputes, once you start a war, it's not easy to end it or undo its consequences. In May 2021, around 300 US manufacturers sent a letter to Joe Biden, lamenting the tariff-resulting "scarce metal materials and

unsustainable prices" as the new president negotiates tariffs with the European Union and approaches talks with Beijing.

Additionally, COVID-19 highlights the pivotal role that seaborne transport plays in global supply chains and the fragility and complexity of world trade. The pandemic has had a "swift and severe" impact on maritime transport services, and the study names the pandemic as one of four major challenges to liberalisation in maritime transport along with domestic resistance to reforms; conflicting interests among low-, middle- and high-income economies; and the proliferation of trade tensions. COVID-19 drew attention to the fact that predictable regulatory and trade policies are vital for the maritime transport sector and, as such, for the global supply chains, especially in times of economic instability. The lack of consistency or clarity in trade regulations could, for example, stifle agricultural imports/exports, which affects food security across the globe, possibly leading to malnutrition or hunger-related deaths, particularly in underdeveloped countries. Similarly, especially during a pandemic, limited access to medical supplies could have grave consequences.

Global upheaval

Clearly, trade wars, conflicting economic interests, resistance to trade reform and unexpected global events such as pandemics can be detrimental to the global trading landscape; in these times of increasing globalisation, their aftermath can be felt across the entire world. By analysing four different, more and less ambitious, scenarios for possible future trade reform, the Protectionism in Maritime Economies Study determined that reduction or removal of trade barriers in maritime trade can be economically beneficial. The results point out that balanced, transparent and well-thought-out trade policies, particularly in maritime, can encourage economic growth, notably if domestic reforms are combined with multi-lateral trade agreements.

Additionally, in times of global upheaval, free and open trade policies ensure that supply chains remain undisturbed, help in sustaining human welfare and economic stability. Furthermore, in the present time, any government policies that facilitate trade could help with the post-COVID-19 recovery, particularly in struggling communities. Even without pandemics or other disruptors, the relationship between trade and poverty reduction is undeniable; in the last 30 years, developing countries nearly doubled their share of global exports while poverty rates dropped from 36% to 9% in the same period. ■

TRUST

Interview with Hans-Christoph Burmeister, Head of the Department Sea Traffic and Nautical Solutions of the Fraunhofer Center for Maritime Logistics and Services

Photo: Canva

Trust in software

by Przemysław Myszka

Autonomous shipping will, in all probability, profoundly change the maritime business, also the land side of it. We are talking with Fraunhofer CML's Hans-Christoph Burmeister about what has already been achieved in making crewless ships a reality and what developments need to take place to further the process. These include, among others, factoring in weather, harmonising different technologies, and building 'trust' between humans and machines.



Hans-Christoph Burmeister, Head of the Department Sea Traffic and Nautical Solutions of the Fraunhofer Center for Maritime Logistics and Services

■ Let us start with the nuts and bolts of autonomous shipping. What are the developments thanks to which we already have real-life projects with an autonomous container ship, domestic ferry, and dredgers?

It is a result of the general automation trend, also when it comes to transportation modes. The maritime industry has already had some experience with sensor and tracking technologies designed for specific control tasks. It has been now combined with advances made in automated decision-making and sensor fusion systems, all very much driven by the automotive sector, which, in turn, should take credit for showing that self-driving vehicles can become a reality.

There are also differences, and not all concepts and solutions developed for the automotive can be used by the maritime industry. Or, at least, not in a copy and paste style. While both use sensors, the particular technologies differ. For instance, ships don't need accuracy measured in

single millimetres. Another example would be lidars, which aren't particularly suited for marine navigation. On the other hand, though, the maritime industry can learn a lot about sensor fusion and redundancy from other segments. There is currently a certain lack of cross-sensor value checking, being up to the officer on watch to determine whether data that comes from the radar matches the one coming from the automatic identification system.

Ships also operate in an altogether different environment than cars. It has its set of pros and cons. Decision-making doesn't have to be that fast, but at the same time it needs to look more into the future. Still, since vessels are large physical objects, the decision you or the algorithm takes now will take time to execute, will last longer, and will be more difficult to alter rapidly. As such, the decision-making forecast is extended over a longer period. We are talking about seconds or even less in cars – to dozens of minutes for ships. Computational power is yet another

issue. Creating a representation of the surroundings, hence situational awareness, isn't so difficult in the open sea. The situation changes when much more is happening, think of in-port activities, or when raw data must be extracted and analysed, especially from additional sources like high-end cameras. They will give you extra input for precise operations, but at the expense of installing strong enough computers.

■ **How important is weather, particularly accounting for bad or even extreme conditions, in developing solutions for autonomous shipping?**

Weather needs to be taken into account as well, as it adds streams of data and impacts the performance of the sensing equipment. Truth be told, although the existence of the topic is acknowledged, it is also somewhat neglected. Autonomous shipping projects currently focus on collision avoidance and anti-grounding. Weather should be very much factored in because it is one of the leading causes of accidents, with incidents that come to pass by floundering far exceeding those that result from ships colliding with each other. Better weather routing can help to a certain degree, increasing the likelihood of avoiding bad conditions in the first place.

As things stand today, we will have the so-called operational envelopes, determining under what conditions algorithms can take over, leaving operations in harsh weather in human hands. Yet, moving forward towards fully unmanned shipping, we will have to make sure ships can ride out the storm.

■ **Can we imagine a situation when there is a conflict arising between what the algorithm would do and what the officer in charge would opt for?**

It is maybe not a matter of two decision-making centres fighting over the next best move but understanding why the software gives particular advice. In other words, algorithms behind autonomous shipping cannot function as black boxes that spit out answers. The people in the loop need to understand the reasoning behind this-and-that decision. For want of a better word, let us call it "trust," in the sense that officers can trust the software that it won't put them in harm's way.

It may as well not be a matter of conflicting decisions, but the sequence. The officer would take a specific action now, while the algorithms would suggest a different one at a later point of time; still, the outcome would be the same in both cases, namely safe operations. Or when the software is actually doing something but not communicating it, prompting the officer to step in and take over control. In a way, it is funny because a lot of what constitutes navigation consists of monitoring. It isn't that the officer on duty constantly tells everybody on deck what they are doing. Nevertheless, revealing the inner life of algorithms is what's needed for building that 'trust in software.'

■ **Shipping is as broad of a term as they get – from inland waterways coal barges to sailing mega-hotels, from liner to tramp traffic, and from vessels that sail the open seas to those having to navigate through near-miss archipelagos and fairways. What ship types are a perfect match for making their operations autonomous, which are so-so, and which won't become crewless in the foreseeable future?**

If by "autonomous" we understand supportive systems helping with monitoring or decision-making, then all ship types would benefit. Again, think of the air industry where the autopilot takes care of much of the flight.

In contrast, if we talk about vessels without onboard crew, there are certain limitations. Cruise ships or long-distance ferries, particularly those covering overnight crossings, aren't the most suitable ones for unmanned operations and thus highly unlikely to be automated. While it is technically doable, airline passengers are against flying without a crew, so it's very much a 'psychological issue,' so to say. On the other hand, domestic ferries that serve shorter routes would be a good match, similar to automated trains taking care of airport traffic. Here you could even envisage a 'travel on demand' service.

The tug market also looks promising. It is a taxing job, potentially very hazardous, too, so making it remote-operated or fully unmanned would secure the availability of this service in the future. It is also a cut-throat market nowadays, so ports and terminals would undoubtedly benefit from ensuring the capacity to handle the traffic around the clock.

In general, fixed-route services are promising, including inland waterways, not only because the operational environment stays pretty much the same but also because you can put technology on the infrastructure, such as aids to navigation. That way, you don't have to rely just on the equipment with which the ship is furnished. Moreover, multiple vessels can use that tech-enhanced infrastructure, so the investment cost on the shipowner's side can be lowered. In turn, it might take some worldwide standardisation agreement to see unmanned vessels in tramp trade, the core of which is the ability to sail globally.

■ **What would be your best-case scenario for the uptake of this technology? Then again, what would shelve the entire thing altogether? In-between, what is your take on how autonomous shipping will progress in the nearest years?**

Seeing one of the pioneering projects having an accident has a high disillusionment potential. It doesn't have to be a Hindenburg-like incident. Still, I'm pretty sure the news would be full of autonomous-ship-went-wrong headlines, underlining that it was a crewless ship even if the accident wasn't the fault of technology, to begin with.

That is probably why the initial trials are carried out in-house, with the party in charge having oversight on both the vessel and cargo.

It wouldn't derail the entire venture altogether; the automation trend is, it appears, robust enough to shoulder such mishaps. Still, it would force the next party to think twice before waving the look-at-us-we-are-launching-an-autonomous-vessel flag. Then again, we had accidents introducing radars or AIS because of these technologies, but we managed to get past and refine the solutions to the point that they have become bread and butter.

The best-case scenario would, in turn, be autonomous shipping catalysing the change from economies of scale to genuinely streamlined and synchronised logistics chains. Instead of ordering the next TEU record-holders, which would then call to even fewer ports than today, we would have unmanned fleets of smaller ships but ones that do sail according to schedule, making the vessel call optimisation topic more

or less redundant. Couple that with automated terminals, truck platooning, and autonomous trains, and you could see the benefits trickling down the entire value chain. I am more than looking forward to seeing the concept validated in real life, perhaps in a region with a well-established short sea shipping network and good cross-country collaboration. This endeavour will require many parties jointly working towards a common goal. There are some promising initiatives in the Benelux involving inland waterways transportation. However, the most significant push will come when one of the largest logistics service providers decides to automate its multimodal global logistics chain. If they succeed, others will in all probability follow suit, automating transport, on- and offshore.

Shipyards would surely also capitalise, as it makes much more sense to design and build a fully unmanned vessel from scratch than having a retrofit. There is also a chance that automation brings more standardisation to ship manufacturing. In all probability, it will never resemble car production, but reaching the airlines level is feasible. Shipowners could then opt for designs that are 'mass-produced,' hence cheaper if you understand by it a model that comes in higher numbers than in today's series of a dozen units at best – and which also differ from company to company. A feeder or short sea shipping company operating a fleet of ten, 20, or 50 identical autonomous vessels? Perhaps that is the future we will have the opportunity to witness with our very eyes.

- **When discussing autonomous shipping, it is often brought up that 'the technology is already there; what is lacking are regulations.' Is that the case? And if yes, then why and what is needed to catch up legal-wise?**

That was, indeed, the argument for a long time – that legal issues will be the main blocker for the uptake of autonomous shipping, at least in international traffic. Interestingly, it wasn't brought up by lawyers. In fact, they are the ones looking forward to establishing new rules because it will open a new field in which they can operate. It was more of a general criticism that, it appears, pops up whenever a new concept starts making it to the top of the agenda.

Over the past four or five years, we witnessed a very open discussion, also on the International Maritime Organization level, about autonomous shipping coming to fruition. Rules and regulations are yet to be fully ironed out, but it is more of ticking it off rather than some grand legal battle that will once and for all decide upon the fate of unmanned vessels. The countries pioneering autonomous shipping are already amending their laws to clear the way, leastwise regionally. In an ideal world, we would already have global regulations, but we can calmly settle for second best and proceed with the works, even in waters that are sort of chartered only.

What would help accelerate the entire thing is harmonising the different technologies that are developed for autonomous shipping. From a global uptake perspective, it simply wouldn't make sense to have separate interfaces, say, for autonomous shipping in Germany, Poland, or Sweden. Naturally, more funding, especially seed, would be more than welcome to lower the financial risk of investing in mass autonomous shipping.

- **Leaving aside autonomous shipping, what are the other technological developments that, in your opinion, have the biggest chance to change the industry?**

Developing sustainable technologies has been a critical driver of innovation for a few years, be they auxiliary engines, main propulsion or other projects that aim to disrupt the maritime business, like alternative fuels.

Unlike digitalisation, where our industry can learn from others, the green fuel part is, it seems, something we have to discover ourselves. Sure, there are electric cars, and some manufacturers have been experimenting with hydrogen for decades now. Still, a seagoing vessel that must take cargo, e.g., from the Nordics to Spain and go back, is a widely different pair of shoes in terms of the needed battery capacity or hydrogen bunkering needs.

The answer might as well be liquefied natural gas, liquid biogas, e-fuels, heavy-duty wind assistance, ammonia, fuel cells, electricity – or probably all of them depending on the shipowner's requirements and market specifics. However, what is needed across the board is a sound alternative for heavy fuel oil, hence also new engine types.

Photo: Canva

Too good to be true?

by Ewa Kochańska

Last year's report ***BioLNG in Transport: Making Climate Neutrality a Reality*** argued in favour of liquefied biomethane (bioLNG), claiming it might be the renewable fuel of the future, especially in long-hauls due to its comparably seamless ability to replace high-emission fossils. The paper analysed the entire value chain to showcase, in particular, its tangible benefits when used in heavy-duty vehicles (HDVs) and maritime transport to decrease pollution and meet the increasingly stringent EU climate targets. The co-authors, the European Biogas Association (EBA), Gas Infrastructure Europe (GIE), The Natural & bioGas Vehicle Association (NGVA Europe), and SEA-LNG also made corresponding policy recommendations on how to streamline the transition to bioLNG to start replacing fossil fuels in the fastest and most affordable way.

bioLNG gets portrayed as a renewable, non-fossil variant of liquefied natural gas (LNG), the cleanest fossil fuel currently available in long-distance, heavy-duty transport. Trucking companies, ship operators, and ports & terminals (cargo handling equipment, handling, storage, bunkering) have been using LNG for some time now. While its use isn't as widespread as traditional fuels, the technology is tried-and-tested, rules are in place, and new facilities are being put on the infrastructure map, on- and offshore.

Facing the realities of the EU's carbon-neutrality goal of 2050, the report authors recognised that solutions capable of meeting this target must be affordable and technologically accessible right now. One of the main benefits of bioLNG, compared to other renewable fuels, is that it can use the same facilities, engines, and technologies as LNG, making it a cost-effective and straightforward transition.

Also, it can be produced locally – as it's already the case throughout Finland and Sweden – further cutting costs and transport emissions.

However, fuelling infrastructure and biogas production capacity needs to build up, meaning that significant government incentives will be necessary (also to drive down the price). Consequently, the report emphasised that to make the EU-enforced emission cut a reality, it's imperative that the European Commission (COM) acknowledges the importance of renewable fuels and supports the utilisation of bioLNG with adequate policies.

Production, benefits, infrastructure

BioLNG is a biofuel made by breaking down organic waste, such as manure, municipal and household waste, or sewage sludge treatment, via anaerobic digestion into methane-rich biogas. It is estimated that a minimum of 95b m3 of

biomethane can be produced annually by 2050, compared to the current 3.0m m3 (some reports show even higher output). The bioLNG production capacity is expected to increase as much as tenfold by 2030. "Navigant estimates the bioLNG demand for transport to reach 461 TWh by 2030. This approximately represents 45-50% of the total production capacity of biomethane in Europe." Currently, bioLNG can be mixed with traditional LNG to reduce emissions. For example, the report reads, "using a 40% bioLNG mix with LNG will help reduce the CO₂ emissions from [...] trucks by 55%."

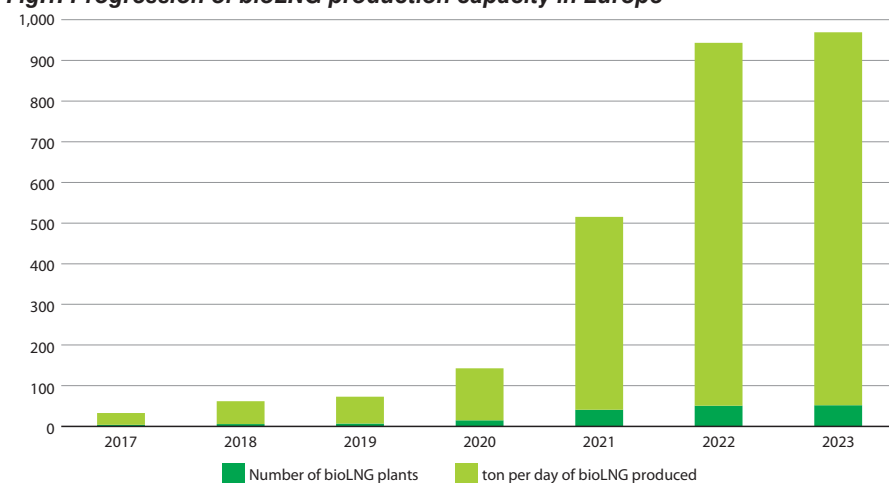
Furthermore, biogas can help prevent methane emissions escaping into the atmosphere from the agriculture and waste sectors. By capturing methane, bioLNG production might as well generate negative carbon emissions. Additionally, the quality and health of the soil in Europe, endangered according to the COM's Joint Research Centre (JRC), could benefit from sustainable cropping, which would later be used for renewable energy. As such, bioLNG can become a driving factor in transport fuels becoming a part of a circular economy instead of being an environmental hindrance.

The paper's authors underline that when policymakers consider various energy sources, they must look at the entire life-cycle of such fuel – on a well-to-wake basis – before making regulatory or investment decisions, among others. Related policy recommendations include extending "the scope of Annex IX of the Renewable Energy Directive to integrate more feedstocks such as residues that cannot be used for other purposes or secondary crops," and creating "a single market for biomethane and bioLNG by facilitating trading of volumes and certificates across borders free of technical or political barriers."

Since LNG on its own has been evolving from a niche fuel to a more mainstream solution to help with improving air quality, Europe already has a sizeable LNG refuelling network in place (though noticeably more in its west- and southern parts). Since bioLNG uses the same infrastructure and technology, this issue becomes pivotal when switching to renewables.

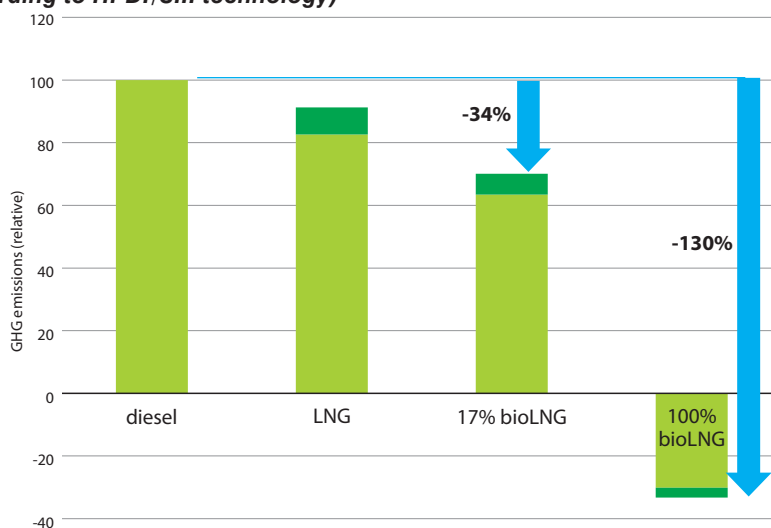
According to NGVA Europe, the number of LNG stations in Europe was above 300 as of 17 November 2020. That sounds like a large number, but considering the already high demand for LNG from regions such as Eastern Europe and the somewhat lacklustre availability of refuelling stations there, much work still must be done in terms of distribution infrastructure.

Fig.1. Progression of bioLNG production capacity in Europe



Source for figs. 1-2: BioLNG in Transport: Making Climate Neutrality a Reality

Fig. 2. Greenhouse gas emissions (vehicle + fuel) for a 40t gas-run truck (min-max according to HPDI/S.I. technology)



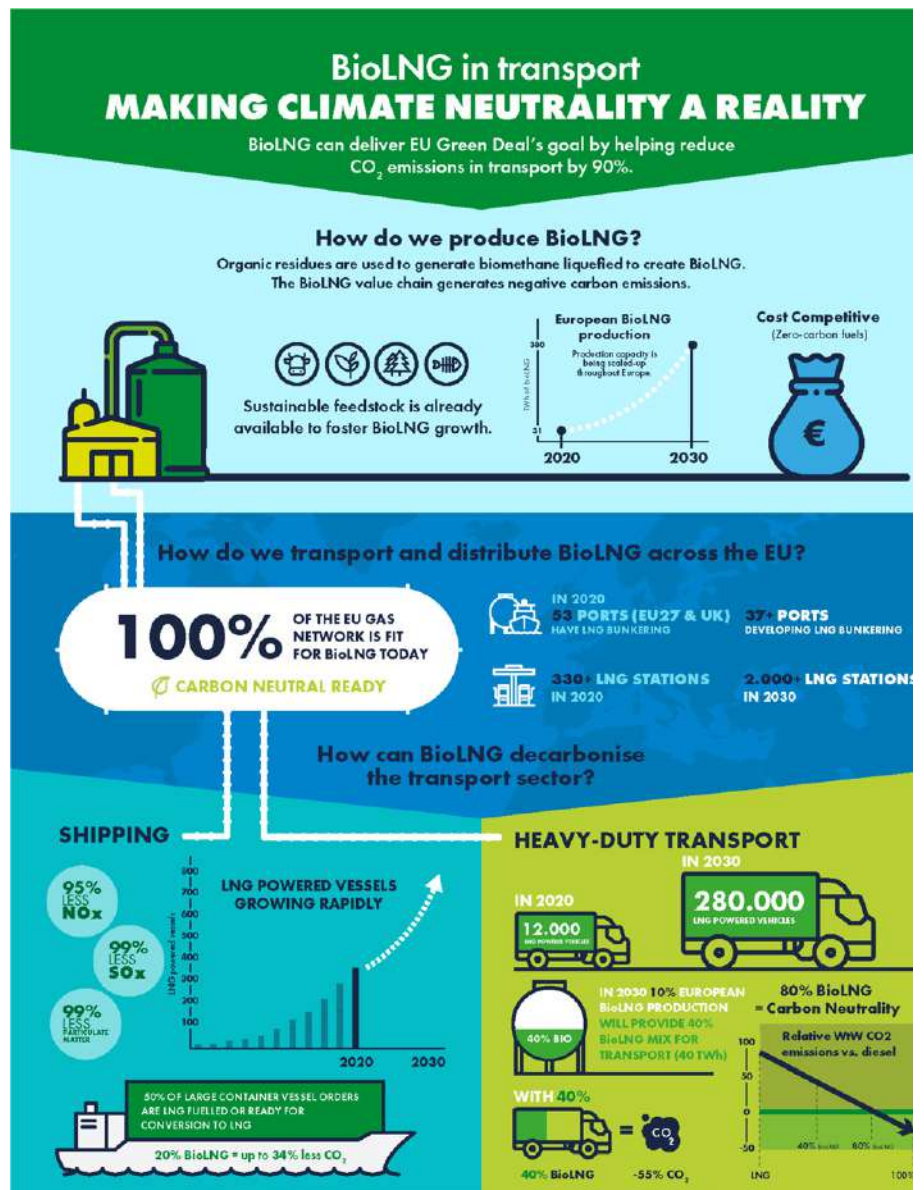
Regarding maritime transport, 118 ports already have LNG bunkering infrastructure/option, and it's under construction at 90 more. In Europe (incl. the UK) in 2020, there were 53 ports with various LNG bunkering options and a further 37 where these facilities were being developed. There is a growing interest in private investment in bioLNG as well. One example would be Shell announcing an expansion of its LNG station network in Germany last year by 35-40 sites. This September, it was followed by a decision to build one of the largest biofuels facilities in Europe (turning a decommissioned Rotterdam oil refinery into an 820kt/year plant). The paper's authors recommend the EU should "recognise the role of LNG infrastructure as an enabler for integrating higher shares of bioLNG, in particular by supporting the development of refuelling infrastructure for road and maritime transport along with SSLNG (small-scale LNG), under

the revision of the Alternative Fuels Infrastructure Directive."

BioLNG in road transport

HGVs are one of the main targets for bioLNG transition. Currently, they add up to about 10% of all motor vehicles globally yet contribute about 50% of CO₂ emissions – and even more in particulate pollution (**a major global health issue in itself**). Electrification of HGVs is one alternative. However, high-capacity batteries are presently needed, such as a 6.4t pack to operate a 40t HDV for more than 1,000 km. For the same distance, 280 kg of LNG would suffice.

The production of gas-powered heavy-duty trucks is also rising, with around 12k LNG trucks already on the European roads in 2020. NGVA Europe predicts that there will be 280k such trucks on the streets by this decade's end. In 2030, they will need approximately 100 TWh in fuel, of which 40% will be bioLNG.



The HDV sector has been slow to reduce greenhouse gas (GHG) emissions due to increased demand for freight transport. With the use of bio and synthetic gas in HDVs, the level of GHG emissions can be brought down; when comparing fossil LNG and diesel, the reduction ranges from -10% to -20% (depending on engine technology), while comparing a blend containing 17% of bioLNG, the emission savings are about 34%. With 100% biomethane, the reduction is -130%.

While the environmental gains become increasingly important from a business point of view, on account of regulatory demands and climate targets, for HDV owners – who are primarily small and medium-sized enterprises, the Total Cost of Ownership (TCO) is a crucial parameter.

Due to economies of scale and high distribution costs, bioLNG is still more

expensive to produce than diesel. Building a biogas facility is also a complex task; issues such as access to the correct type of organic waste, maintaining proper temperature and moisture, and producing enough gas to make the infrastructure financially viable are challenging to overcome.

That said, the report states that LNG-powered trucks lower the TCO when compared to diesel vehicles. Currently, the high costs of an LNG truck can be offset by the price difference between LNG and diesel: when averaging the last 20 years, natural gas has been about 35% cheaper than oil. Also, its price point has been more stable.

Still, the right type of policies are needed to compensate for the currently high costs of bioLNG production. The authors recommend to “adopt an approach based on technology openness and guarantee a true level playing field

between different mobility solutions under a well-to-wheel thinking; integrate the bio dimension of LNG in the revision of the CO₂ emissions standard regulation for HD vehicles to stimulate a quick take-off of the decarbonisation effect; acknowledge the benefits of LNG/bioLNG in road transport to reduce local pollutant emissions.”

BioLNG in maritime transport

Right now, there are around 170 LNG-fuelled vessels of all sizes and shapes, plus another 150 LNG-ready ships in operation, most of them in Europe. Some 230 are on order. The numbers are growing, but it's still a fraction of the 53,973-strong global merchant fleet (ships over GT 1,000 in 2021). Newbuild orders include 13% of LNG-run and 16% LNG-ready vessels, while in the ultra-large container ship segment, more than half of all orders are either for LNG-fuelled or LNG-ready vessels. In November 2020, TotalEnergies and CMA CGM hit a milestone when the latter's *CMA CGM JACQUES SAADE* got the world's largest LNG fuel batch of 17.3k m³, 13% of which was bioLNG.

LNG as a marine fuel can reduce GHG emissions by 21% compared to oil-based fuels (over the whole life-cycle from well-to-wake). That, paired with the Energy Efficient Design Index (EEDI) improvements to vessel design, means that gas-run ships will likely be consistent with the IMO 2030 target for newbuilds as well as the current European 2030 target. BioLNG, even if at first used only as a drop-in fuel, can offer reductions of up to 92% compared to fossil LNG in the combustion cycle, “with even further reductions possible on a well-to-wake basis depending on the origin of the bioLNG.” Furthermore, “It also virtually eliminates particulate matter, including black carbon or soot, which, while not yet regulated, is a growing environmental concern.” Since bioLNG is (renewably sourced) liquefied methane, the only emissions related to it have to do with “the combustion of the very small amounts of pilot fuel used in LNG dual-fuel engine technologies.”

When using the CAPEX data on LNG-fuelled ships of different types and trade routes compared to traditional marine fuels, LNG shows the best return on investment on a net present value basis when compared to low sulphur fuel oil over ten years. Paybacks range from less than one year to five years (and the costs continue to fall). BioLNG's CAPEX is the same as LNG, while price-wise, “bioLNG blend is currently viable in NW [northwestern] Europe, with a 10% blend of bioLNG with LNG on par with 0.10%

marine gasoil [...] in Rotterdam.” Additionally, **a recent study from CE Delft** shows bioLNG as financially competitive with other green fuels such as green hydrogen or ammonia, with an advantage over other renewables thanks to its compatibility with LNG infrastructure, engine, and bunker technologies.

The main problem related to LNG and bioLNG often discussed in maritime transport is methane slip. It can occur during bunker transfer when some of the gas leaks or from fuel that is not burned in the combustion process. This issue, which has been a problem particularly with older LNG-engine designs, is being continually addressed by engine and ship engineers and manufacturers. For instance, “[Man Energy Solutions] indicates that engine design changes together with new solutions for post-treatment and the transfer of technology from high-performance two-stroke [...] to four-stroke engines have the potential to reduce methane slip by a value greater than 90%.” Another ship engine manufacturer, Wärtsilä, reported they have been able to reduce methane slip from its dual-fuel engines by 75% over the last 25 years, while WinGD added technology improvements resulting in a reduction of methane slip in its two-stroke low-pressure internal combustion engine by 50%.

Here, the authors of the report recommend policies that “adopt an approach based on technology openness and guarantee a true level playing field between different mobility solutions under a well-to-wake thinking; integrate the bio dimension of LNG in the revision in GHG reduction targets for shipping to stimulate a quick take-off of the decarbonisation effect; acknowledge the benefits of LNG/bioLNG in maritime transport to reduce local pollutant emissions.”

The final step

The transport industry has been slowly realising the benefits of using LNG and drop-in bioLNG to cut its sizeable carbon footprint. To meet the increasingly demanding emission standards worldwide, the sector must consider and invest in 100% renewable fuels. As such, the report urges the European authorities to acknowledge the potential of bioLNG in achieving the EU and Paris Agreement climate targets. The final step away from fossil fuels in transport cannot be achieved without the help from policymakers who need to consider creative incentives and government stimuli when planning future transport legislation and national strategies to ensure a swift green fuel transition. ■

170+ operators
620+ ports
1,130+ services
1,150+ terminals



EUROPEAN
TRANSPORT
MAPS

EUROPE:

all over the ro-ro & ferry,
container, and rail maps

www.europeantransportmaps.com



Photos: Canva

Battle royal

by Przemysław Myszka

“At its core, decoupling is really a contest being fought over the economy of the future.” That is how the European Union Chamber of Commerce in China’s *Decoupling. Severed Ties and Patchwork Globalisation* report ends. It is a tale of how the world’s three biggest trading blocks, China, the European Union (EU), and the United States (US), are, it seems, increasingly distancing themselves from one another. The divide is most likely the sharpest and widest as far as anything digital is concerned, particularly on the China-US front, with Europe caught between a rock and a hard place. It provokes the question of whether globalisation is a thing anymore. Digital firewalls, export bans, trade tariffs, announcements of self-reliance and market dominance, cleansing of foreign technologies from one’s systems, politicisation and weaponisation of trade, principal cultural values that exclude each other – all those and many more issues brought up by the Chamber are thorns in the flesh of overseas cooperation. If somebody is still up for handshakes and bows, that is. In President Xi Jinping’s words, we may as well be entering the period of “assassin’s mace,” measures developed to pack a hard punch. It does not bode well for issues that require shared effort, like greening the global economy.

One of today’s most noticeable signs of decoupling is the automotive sector’s pains in sourcing semiconductors necessary for putting together electronic control units (ECUs) – the car’s computers. First, with a 45% share (2018 data), the US dominates the semiconductor production market (China has 5%). Second, the Trump Administration has hit-listed China’s Semiconductor Manufacturing International Corporation, the country’s most advanced manufacturer. Third, the Entities List gives the US the option to cut off supplies to companies on the deny-list as per the de minimis rule, namely if a certain threshold of a product’s value derives from American sources (typically

25%, but the figure can change any time). It puts European automotive manufacturers sourcing chips from the US for their production in China in a difficult position (Europe’s share in semiconductor output is 9%, so also insufficient to make up for the potential cut-off). It has led to a persisting crunch, with car production lines on hold and the available ECUs used to deliver higher-margin earning vehicles. Other industries, hence consumers, are also feeling the hard way what decoupling means, as evidenced by exorbitantly high prices of graphic cards (with tariffs, supply chain distortions caused by the pandemic, profiteers, and cryptocurrency miners adding insult to injury in this concrete case).

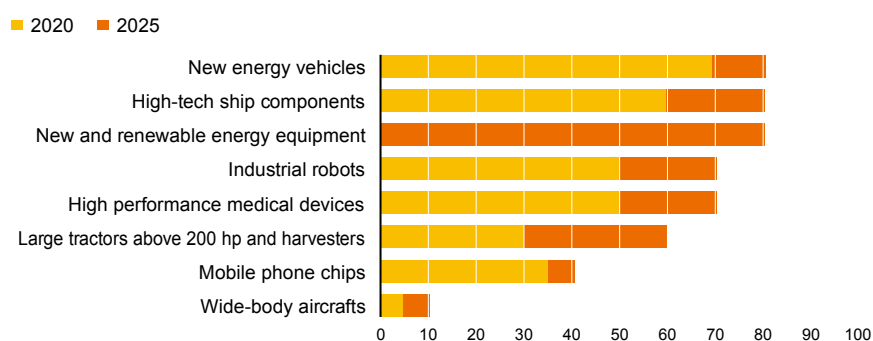
Another politically motivated decoupling has taken the form of China's ban on the import of Australian coal. Although trade has lately been soaring between the two economies (+20% in 2018-2019), so have tensions; these varied from politicians exchanging insults via banning Huawei from Australia's 5G network to embargoing beef imports from Australia and hitting its barley exports with an 80.5% tariff. Concerning coal shipments, "As a result, during the first six months of 2021, Capesize and Post Panamax vessels performed 17% less Australia to China journeys, carrying 14% less in cargo volume, compared to the same period in 2020. Despite a reduction in trade between Australia and China, many vessels continued their voyages to China, and this resulted in significant numbers of laden bulkers stranded off Chinese ports, waiting to discharge their cargoes," reads Ves-selValue's **2021 Port Congestion Report**. Among many, there was the Post Panamax Topas, which waited near Jingtang for eight months. China, wanting to increase its domestic coal use, ended up troubled by energy outages and the need to take in coal from other, noticeably farther away located exporters such as South Africa. Australia has, in turn, had to find new outlets, chiefly Japan, South Korea and, interestingly, also coal-rich India.

Whole-of-nation system

Since Deng Xiaoping's reform and opening-up, China has been perceived as an enormous market with a potential purchasing power second to none. Meanwhile, owing to its massive labour force, the country has managed to position itself as the 'world factory.' Both still hold, even though some industries that rely on poorly paid employees, little-to-no regulatory oversight, and end-consumers' fixation with low price, have packed their bags and moved elsewhere in south-east Asia (think fast fashion). That said, the Chinese people's desire to consume products and services of increasingly higher quality and quantity has risen, too, alongside the will to produce and sell them, domestically and abroad.

According to the China Manufacturing 2025 initiative, the country will replace global competitors in several strategic technologies (Fig. 1). It stands to reason that China will continue its current practices to that end: selectively coupling with foreign partners in areas it lacks the know-how to eventually decouple when its national champions are sufficiently trained to first muscle out the

Fig. 1. The China Manufacturing 2025 initiative (semi-official percentage targets for the domestic market share of Chinese products)



Source for all figs. and tabs.: European Union Chamber of Commerce in China's Decoupling. Severed Ties and Patchwork Globalisation

Tab. 1. Export controls for certain technologies and sectors as proposed by US Department of Commerce

Biotechnology	Data analytics	Robotics
Artificial Intelligence and machine learning	Quantum information and sensing	Brain-computer interfaces
Position, navigation, and timing	Logistics ¹	Hypersonics
Microprocessor	Additive manufacturing	Advanced materials
Advanced computing		

¹ Including mobile electric power, modeling and simulation, total asset visibility, and distribution-based logistics systems

competition from the Chinese market and then gain a foothold outside the country. "For example, high-speed rail technology in China developed quickly due to extensive state support combined with mandates for foreign technology transfers as a condition for market access. Once China's high-speed rail companies were confident enough, market access was tightened, though not through direct means such as a change to the legal regime governing foreign investment. Instead, the high-speed rail sector was subjected to one of a plethora of indirect barriers that have long plagued China's business environment. In this case, handpicked, state-owned national champions benefited from an unfair procurement system, which quickly gave them complete market share and the ensuing economies of scale that drove down their costs considerably," authors of *Decoupling* caution (read more about the impact of China's procurement system on European companies in our **Second fiddle? Europe's participation in and response to the Belt and Road Initiative**).

While the issue at hand might sound like nothing more than the struck record of market rivalry, the involved blocks differ regarding what could be allowed as fair (let alone legal) competition measures. China and the US are poles apart, though also oddly on the same page regarding specific tactics. Even more strangely, the tit-for-tat trade war between the two has only obscured the

bigger picture. Though eye-catching, chiefly thanks to President Trump's media ruffling, the hurling of trade tariffs did not cripple China-US trade. Companies, especially multinationals doing business in China, were quick to mitigate the political 'fury' coming from the other side of the Pacific. "One manufacturer had operations in Japan that were mainly for supplying the Japan/South Korea/Taiwan markets, while its China-based factories focussed heavily on exports to the US. The manufacturer simply had its Japan-based production export finished goods to the US and its China operations supply the Japan/South Korea/Taiwan markets," reads one of the examples from the Chamber's report. "The total volume of trade between the two economies did not change significantly and, if anything, increased," the authors add.

While not neglecting the importance of trading soybeans, coal or aluminium, the top tier economy of the future will be about all things digital, with products, services, and processes driven by Artificial Intelligence (AI), big data (BD), and the Internet of Things (IoT). As things stand today – or more precisely: get out of sync – the question is whether it will be American, European, or Chinese AI, BD, and IoT. In other words, we are dealing with an increasing techno-nationalism, "Whether it's the US' Clean Network proposal [purging Chinese technologies from American systems] or measures by Chinese authorities aimed at creating 'autonomous and controllable' technology

Tab. 2. Layers of decoupling

Macro decoupling	Political	The politicisation of business and geopolitical tensions is making the Chinese business environment increasingly difficult for foreign companies to navigate and act as catalysts for decoupling in other areas.
		The current impacts on European companies in China include increasing risks due to a souring of public opinion in home markets towards China, a drop in business sentiment, and uncertainty for operations due to the securitisation of business flows.
		The European business community in China is worried about the increased risk associated with 'political reciprocity' dynamics and the potential for more unpredictable tit-for-tat exchanges of economic restrictions resulting from political/diplomatic tensions.
	Financial	To further reform its financial system, China is working to integrate into the global financial system by establishing new investment channels into its capital markets and new opportunities for foreign financial institutions and investors.
Trade decoupling	Supply chains	As long as China lacks a fully convertible capital account and an internationalised renminbi, its reliance on the USD remains its 'Achilles heel'. Efforts to internationalise both its currency and financial markets are likely to accelerate, but liberalisation is needed to do so.
		Any broad restrictions on access to the USD would amount to a 'nuclear' option that would bring considerable economic damage to the US and the rest of the world. A massive escalation of political tensions seems likely to trigger it, as happened with Russia and Iran.
		Supply chains were already changing considerably in China before the COVID-19 pandemic or the trade war, with low-cost production moving elsewhere and most European companies expanding locally and further onshoring their supply chains.
		Although the trade war and the pandemic had been disruptive and expensive, still, European multinationals proved resilient, making shifts in supply chains to outright avoid many tariffs and maintain operations in China during its COVID-19 recovery.
		Many European companies report a desire to invest further in China and onshore supply chains for the local market to avoid potential disruptions. However, enthusiasm varies by sector based on how welcome they feel in the market.
Critical inputs	Targeted restrictions on the sale and export of critical goods – such as semiconductors, related manufacturing equipment, software, or even rare earths – have become a more pressing concern for companies operating in China and globally.	
	European companies have so far felt a limited direct impact due to export controls, but exposure is considerable for most. Pandemic-related shortages have shown how damaging lost or limited access can be, giving companies a taste of what the future may hold.	
	Even companies with little to no risk may still be hit if their suppliers/customers can no longer source components or equipment from abroad. China's new export controls increase risks as well, as locally developed goods and solutions could be blocked from export.	
Innovation decoupling	Research & development	Although China is an increasingly attractive R&D destination, a number of issues – some long-standing and intensified by decoupling trends, others that have recently emerged as a result – constitute barriers to European companies' R&D activities.
		In Europe, government stakeholders are re-considering their engagement with China on innovation cooperation, and the EU is working on tools to prevent unfair practices within its internal market.
		Consequently, European businesses will encounter increased difficulties when developing both their global and China R&D strategies.
Digital decoupling	Standards	While access to standardisation bodies in China has improved considerably in recent years, European companies – particularly in key sectors – still face informal barriers that prevent them from effectively engaging in standards-setting in China.
		These access issues become all the more relevant when considering China's use of standardisation as a tool to advance its industrial and geopolitical agenda both at home and abroad.
		As a result, European companies may see their competitive edge being dulled and their market share reduced. At the same time, these standards-setting trends could also lead to distortion, or even fragmentation, of the global standardisation system.
	Data governance	Data governance regimes in China and the EU already significantly restrict the transfer of data across the borders of these jurisdictions, creating significant compliance risks for companies.
		European companies anticipate that further restrictions on privacy and national security grounds will come into force soon, partly due to new legislation and judicial decisions in the EU and further measures in China.
		As a result, it will be difficult and risky to exploit the potential of data pools across the EU's and China's jurisdictional boundaries, even as the importance of data as a tool for innovation and efficiency-building grows.
	Network equipment	US efforts to decouple from Chinese telecommunications and network equipment and scrutinise any China-originated links found in network value chains under its Clean Network programme are impacting European companies and their offerings in the US market.
China's rapidly expanding barriers to foreign telecommunications and network equipment value chains via requirements for 'autonomous and controllable' technology is pushing European players out of the market or into niche roles.		
In combination, these dynamics are inadvertently forcing companies to consider firewalling their China and US network operations from one another, with the former relying more and more on local solutions and the latter being stripped of China-sourced inputs.		
Telecommunication services	China's long-standing barriers to foreign telecommunications services and digital solutions have surged, especially regarding the digital technology at the centre of the fourth industrial revolution, which includes value-added telecommunication services like cloud and data centres.	
	European companies are forced into joint ventures with Chinese counterparts to offer their digital solutions, which increasingly come from traditional industries outside of ICT/ telecommunications.	
		As a result, European companies often have to integrate their products with locally sourced digital solutions to serve local customers, resulting in the provision of suboptimal offerings that are not globally interoperable.

Tab. 3. The European Union Chamber of Commerce in China's Members' impact assessment of decoupling (% of respondents)

Area of decoupling	All negative (significantly negative)	No impact	All positive
Digital/telecoms	85% (34%)	12%	0%
Data governance	76% (24%)	16%	4%
Financial	70% (23%)	23%	1%
Supply chains	68% (23%)	23%	6%
Standards	68% (15%)	22%	5%
Self-sufficiency	64% (15%)	26%	6%
Political	59% (12%)	34%	0%
Critical inputs	49% (15%)	42%	3%

[made in China solutions], it is all part of the same slippery slope: the technologies that are defining the future, and which are increasingly integrated into every sector of the economy, are being divided between two of the world's three largest economies, each of which has a growing firewall separating itself from the other." From a European perspective, this dichotomy is hard to swallow. On the one side, Facebook/Meta and the National Security Agency of the US spying on its citizens and foreign allies alike, a digital dictatorship on the other.

Drivers and layers of decoupling

While European companies may benefit from the China-US tug of war in the short-term,

ousting its American rivals from Chinese deals, they might find themselves left on the back burner should their Asian counterparts decide it's time to proceed on their own.

The European public eye is also increasingly scrutinising the block's governments and companies' approaches to human rights issues. These include forced labour, with the Australian Strategic Policy Institute releasing in March 2020 the ***Uyghurs for sale: 'Re-education', forced labour and surveillance beyond Xinjiang*** report, in which the organisation identified 83 foreign and Chinese companies as allegedly directly or indirectly benefiting from the use of Uyghur workers (some 80k) outside the province of Xinjiang through potentially

abusive labour transfer programmes. The report is alarming because it shows that abstaining from doing business in Xinjiang or relocating factories from the region is not enough – and that forced labour isn't a matter of geography, as if erecting a production site a stone's throw from the province's borders would fix anything, but supply and demand. And there are the Hong Kong protests; for example, Cathay Pacific, the flag carrier of Hong Kong, was compelled to suspend staff that appeared to have displayed support for the pro-democracy movement. That is not to mention China's long-standing, and it appears nowadays – hardening, line of treating Taiwan as part of the People's Republic of China, with a harsh backlash against anyone naming or just hinting at the island as an independent country. The actor John Cena has recently become a meme after professing love to China in response to calling Taiwan a country – in all probability to prevent getting the ninth episode of the *Fast & Furious* off mainland China cinemas, Hollywood's biggest overseas market. Meanwhile, Lithuania and Taiwan's intention of establishing representative offices has prompted China to discipline the Baltic country by scratching train stops in Vilnius, thus turning



Fig. 2. Three possible stages of globalisation and what they would mean from a macro, trade, digital, and innovation perspectives

Increased decoupling					
		Globalisation renewed	Patchwork globalisation		Globalisation disrupted
Geo-economic strategies		Liberal integrationist, principled multilateralism	Open strategic autonomy; plurilateral and like-minded clubs Self-sufficient 'dual circulation' and nationalism		Winning and prevailing; 'my country first (or alone)'
MACRO	Politics	Rules-based alignment; financial stability	Systemic competition; financial uncertainty Permanent politicisation; financial disintegration		Conflict; financial disruption
	Finance				
TRADE	Supply chains	Integration and reciprocity	Fairness and leverage in strategic competition; diversification and resilience Securitisation of commercial flows; reliance, dominance and control		Weaponising interdependence; reshoring and nationalising
	Critical inputs				
DIGITAL	Data governance	Deep connectivity	Digital distance Digital disintegration		Digital dilemmas; data exploitation and bifurcation of technology stacks
	Network equipment				
	Telecommunications services				
INNOVATION	Standards and IP	Techno-globalism	Industrial policy renewal Techno-nationalism		Technological autarky
	R&D				
Decoupling status		'Trusted open relationship'	'Marriage of convenience'		'Moving (staying) out' and acrimony

Lithuania into a transit country only for the New Silk Road. Transport companies complain that Lithuanian containers now have to be hauled from the border with the Kaliningrad Oblast.

The authors of *Decoupling* also write, "Catalysed by the COVID-19-induced disruption of global supply chains, there is a growing debate about vulnerabilities associated with a perceived 'over-dependence' on China with regard to imports of certain critical products (rare earths, personal protective equipment, or the battery, hydrogen and cloud technologies, among others)." Then again, there is this sense of hope that trade and business between China and the EU will, this way or another, continue to flourish, politics-no politics. One 'coupling' example from the Baltic Sea region would be the set-up of several facilities to cater to the battery market, posed to grow as Europe's electricity generation shifts towards renewables. It all started with Northvolt Ett, a lithium-ion battery production site under construction in Skellefteå in northern Sweden (annual capacity of at least 32 GWh by 2024, with the potential to expand to 40 GWh in the future). The Swedish battery producer will also establish – on the territory of the Pomeranian Investment Centre, near the Port of Gdańsk – what it says will be Europe's largest energy storage factory. The 50k m2-big facility will be set up in two stages, with works on the first to commence in autumn 2021;

initially, from 2022, the plant will have an annual output of 5.0 GWh of energy storage modules and packs, up to a total capacity of 12 GWh after the completion of the second phase. Third, Shenzhen Senior Technology Material will erect a production line, its first outside China, at the Svista industrial estate, with supplies going by rail via the Eskilstuna Intermodal Terminal. Once operational, the Senior Eskilstuna factory will provide the Northvolt Ett with separators. The involved seaports, Gdańsk and Gothenburg, will benefit from handling supplies coming from overseas to 'fuel' the production lines. The Swedish Scanlog has been contracted to take care of the logistics for Northvolt's activities in the country, ramping up its capabilities in Gothenburg to account for the increase in shipments.

However, the overall feeling is that the business environment in China has become more politicised lately, thus prone to abrupt change as per the shifting line of the Chinese Communist Party (CCP). According to the Chamber's *Business Confidence Survey 2020*, some 43% of respondents "[...] stated that China's business environment had become more political over the previous year, with almost half of those saying that external political pressure was being exerted by the Chinese Government and media." The report furthers, "If a country has political tensions with China, the Chinese public and government tend

to scrutinise its businesses more. The greater the tensions, the more exposure a company has to negative messaging on Chinese social media [...]."

While experts debate what constitutes the "**Chinese State Capitalism**," the Chamber notes a profound shift from Deng Xiaoping's times, namely that CCP members are penetrating companies across the board. It is especially problematic for those European enterprises that must form a joint venture with Chinese companies to enter the market. Atop that sits the necessity to pick from two unprepossessing options: to start a JV with your competitor or partner with somebody outside the sector, hence receiving no added value. The Chinese history of industrial espionage and disregard for intellectual property would further take it beyond palatability; if it hadn't been for the princely revenues of China's internal market, that is. Of course, not all sectors of the Chinese economy are subjected to such a dilemma. Yet, those picked to attest of the country's coveted dominance – unavoidably so. As such, it is all the more thought-provoking to see the recent opening up of the lucrative Chinese financial services sector. Albeit done cautiously, it has included events like taking full ownership of its Chinese securities business by Goldman Sachs. On the flip side, "[...] 16 per cent of members reported having felt compelled to transfer technology to maintain market access,



in strategic industries like medical devices, aerospace and aviation, and environment, this number rose to close to a third of respondents.” Are we up for the repetition of the high-speed rail scenario then?

The global financial system will most likely be another of the battlegrounds between China and the US. The latter has dominated it through its currency, whereas the Chinese renminbi (RMB) struggles internationally. “Despite the size of China’s economy and the RMB being upgraded to an international reserve currency by the International Monetary Fund in 2015, the share of RMB payments in cross-border transactions was just 1.66 per cent in October 2020. [...] Even China’s flagship BRI [Belt and Road Initiative] projects are primarily being funded in USD,” reads the Chamber’s *Decoupling*. Losing control over its currency, including exchange rate and possible outflow, makes the CCP sit on the fence between full liberalisation and tight domestic supervision.

Given its upper hand position, the US has, in theory, the ‘nuclear’ option of weaponising the dollar by “[...] preventing financial institutions from offering their USD clearing services to Greater China-based clients through increased

sanctions.” Should political and security matters take precedence over economic considerations, the Chamber cautions, shock waves will hit the global economy. Economically speaking, China isn’t Russia or Iran, against whom the US has exercised the currency-cut-off measure, and the fallout would severely affect the attacker, too.

In the meantime, the US has put into effect lesser, although caustic, means. American investments in entities having links with the (rising in power) Chinese military are banned. The US administration has also reasoned with pension funds to stop investing in Chinese stocks. The European Council has taken similar steps, “While not mentioning specific countries or regions, the regulation [*Council Regulation 2020/1998 of 7 December 2020 concerning restrictive measures against serious human rights violations and abuses*] gives the Council the possibility to freeze and restrict access to funds and economic resources for ‘natural or legal persons, entities or bodies responsible for, providing support to or otherwise involved in serious human rights violations or abuses, as well as those associated with the natural and legal persons, entities and bodies covered’,” mentions the Chamber.

Technical-turned-political

Standards of business conduct, research and development, and privacy also differ, including how data are handled. Reciprocity is hardly a thing when European companies have to hand over their data sets but cannot transfer information outside Chinese borders. It put sand in the wheels of multinationals, who miss out on the opportunity of working on combined globally scaled data pools from Europe and China (think pharmaceutical companies or research & development on autonomous vehicles).

On the other hand, European standards provide for a borderless flow of data – something that might very well change soon, as the von der Leyen Commission weighs the pros and cons of Europe’s openness in this regard. “Government regulations in this domain [data management], originating from both China and the EU, have already caused disruptions to cross-border data flows, as different jurisdictions impose sweeping data localisation requirements due to a combination of privacy, national security and economic concerns,” the Chamber observes.

The Chinese are aware of it and are preparing accordingly by instituting their standards, intentionally defying

international standard-setting bodies, or pushing their standards through them. “A discipline traditionally considered highly technical, standardisation has become increasingly politicised in recent years,” the Chamber notes. In principle, standards developed in China aren’t, for want of a better word, “bad” just because they are Chinese. There are, however, certain red flags to take account of. Among them is that non-Chinese parties are generally excluded from standardisation activities in China; the top three restricting issues are unclear access procedures, unavailability of information, and the inability to obtain full voting rights. The rate of adopting international standards has also gone down in China, the Chamber reports. At the same time, convergence between domestic and international standards remain “extremely low.” Finally, “In areas such as ICT [information and communications technology], cell and gene therapies, smart manufacturing and new energy vehicles [...], an increase in domestic standardisation activities has been observed by European Chamber member companies.”

The BRI is also used as a means for promoting Chinese standards outside the country’s border, “If a project-recipient country accepts the use of Chinese standards, the immediate effect will be a drastic reduction in the chances for foreign companies to participate in such projects.” It could also “[...] result in an increased economic and technological dependence of these third countries on China and, in a worst-case scenario, contribute to the fragmentation of the global standardisation system.”

The crippling

According to the Chamber, if left unchecked or further rubbing salt into wounds, all of the above will result in European companies deciding to leave the Chinese market or adapt. “[...] the global technology ecosystem has already deteriorated to the point where some companies are seriously looking into which of the unappealing options available to them is the least damaging. Others are beginning to wake up to the fact that the date for exiting China may be approaching,” says the Chamber.

Enterprises will fall into one of three categories, starting with the ‘Business Class,’ which will include companies encouraged by the Chinese to strengthen their foothold in the country, like semiconductor manufacturers or software developers. Then the ‘Economy Class,’ companies whose presence neither poses a threat nor an advantage to CCP’s plans (car producers, among many). Lastly, the ‘Cargo Hold’

type: enterprises at increasingly higher risk of getting the wolf ticket (such as ICT).

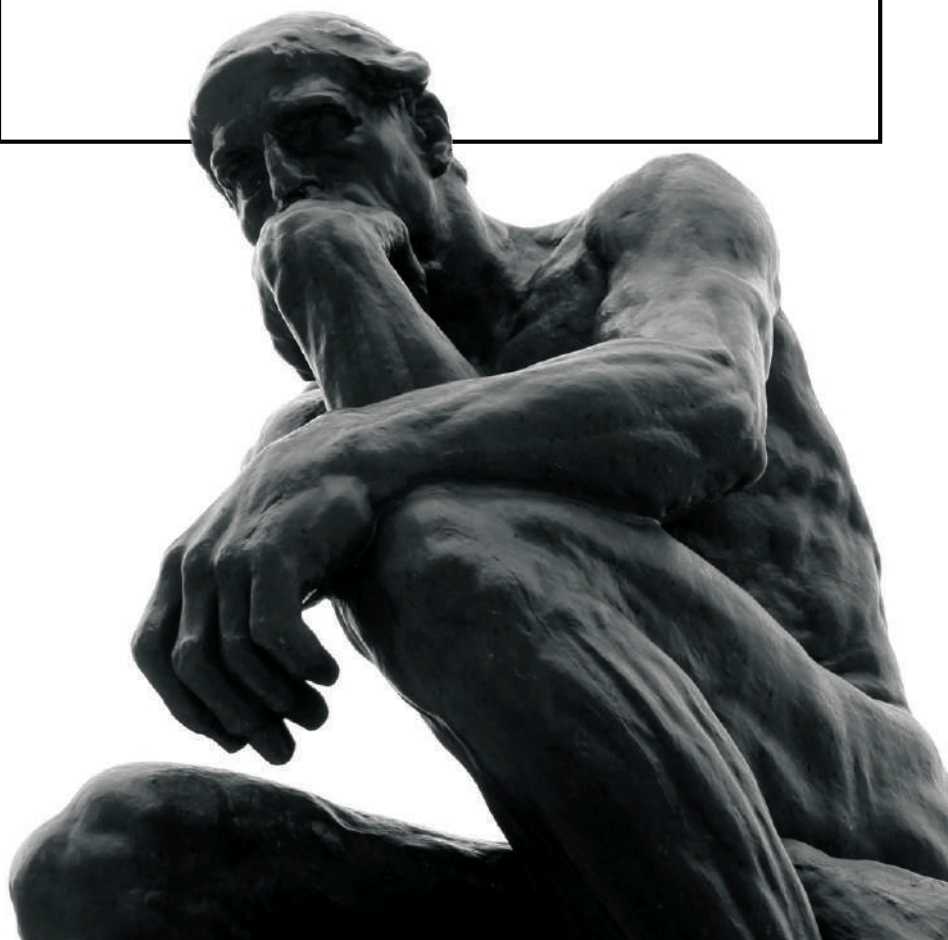
Choosing to stay will necessitate going down two exclusive paths: adopting a dual-system model or incorporating a flexible architecture, both disadvantageous compared to how companies would prefer to operate. The first would involve setting up two separate supply chains and research & development systems – one to serve China (and, future-wise, its “dependencies”), the other for the rest of the world (if the rest won’t fall victim to Balkanisation, that is). The Chamber predicts, “[...] the immaterial costs of the technology war will be extensive. Innovation that drives efficiency gains, as well as new goods and services, will take a significant hit. This is not only due to the cost of running dual R&D systems (every euro spent to localise into one or the other market is one less euro spent developing new technology at the global level) but also due to the growing isolation of data pools, which diminishes the ability of companies to build efficiencies and find new solutions.” The other possibility would be to deliver products and services as neutrally as possible for the global market, customising them to suit the particular landscape of regulations, standards and politics, something which certainly sounds easier said than done.

The Chamber’s *Decoupling. Severed Ties and Patchwork Globalisation* soberly summarises the situation by stating, “There is no returning to a period in which globalisation is renewed to some pre-Trump ideal, because such a time never really existed – China was not coupled with the rest of the world economy in many areas, and its self-reliance drive that is providing a backdrop to the current state of affairs had already been well in place for more than four years.” Suppose governments cannot iron out a risk-managing framework. In that case, the Chamber bodes no good to the global economy as “[...] entire industries will become completely impenetrable due to intensive restrictions imposed in the name of national security or self-reliance. The unthinkable result would be the crippling of global value chains, economies of scale and innovation systems.”

Resources would go for coping with what was an avoidable but now highly irreversible reality, with every dollar or renminbi allocated for ‘cleaning networks of non-autonomous and uncontrollable’ technologies being one less spent on development. But maybe that’s the idea behind the new arms race – bleeding out the opponent to seize the means to advance the agenda further. One’s scheme, precisely. “The conquered mourns, the conqueror is undone.” ■

bimonthly-daily companion
Baltic Transport
Journal

*Thinking of
transport & logistics?*



Go to
Baltic Transport Journal for your food for thought

www.baltictransportjournal.com

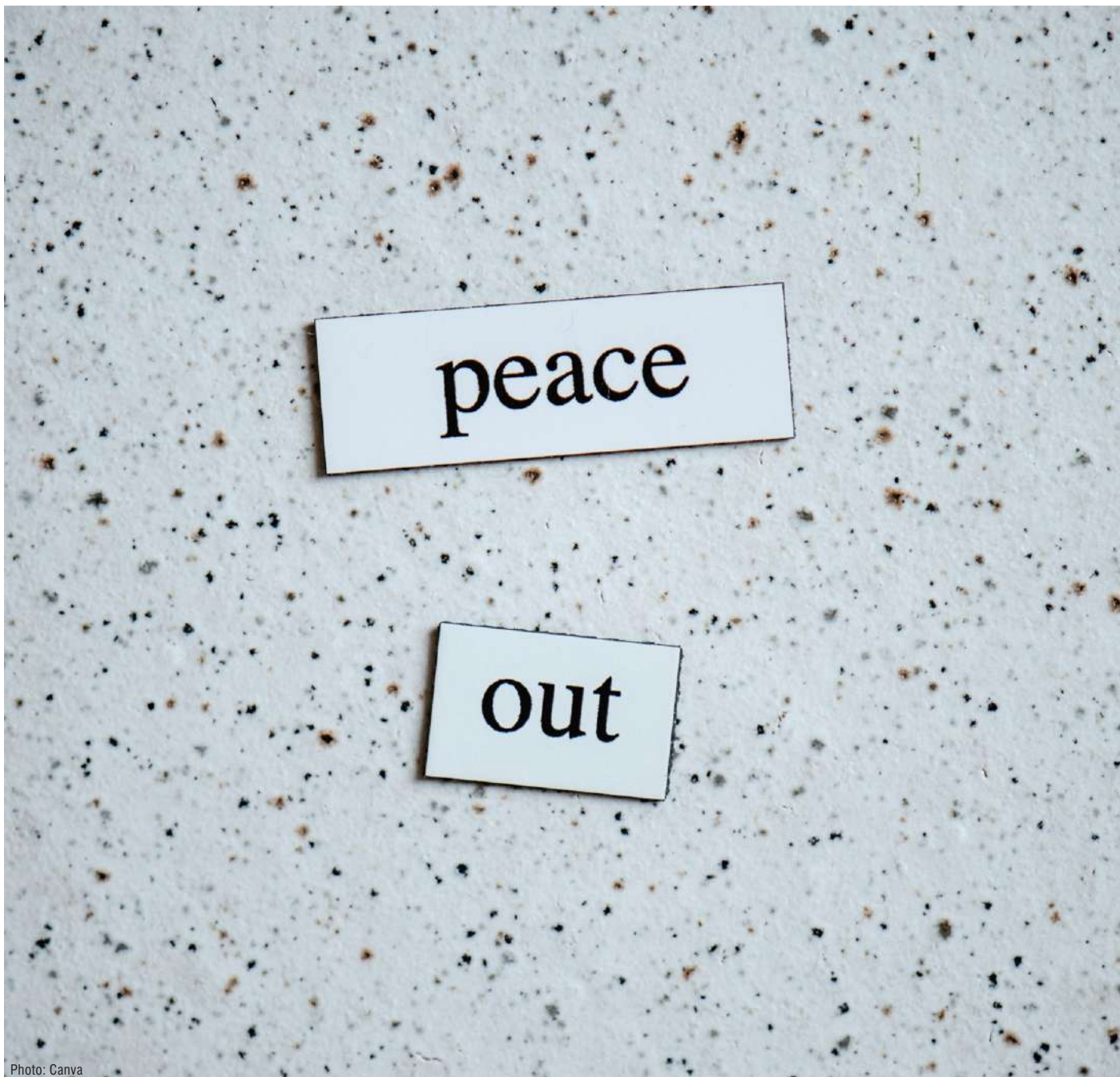


Photo: Canva

■ **PUBLISHER** ■ **Baltic Press Ltd** ■

■ ul. Pułaskiego 8 • 81-368 Gdynia • Poland • tel.: +48 58 627 23 21/95 ■
■ editorial@baltic-press.com ■ www.harboursreview.com ■

■ **Board Member:** Beata Miłowska

■ **Managing Director:**

Przemysław Opłocki • po@baltic-press.com

■ **EDITORIAL TEAM** ■

■ **Editor-in-Chief:** Przemysław Myszkowski • przemek@baltic-press.com

■ **Proofreading Editor:** Ewa Kocharńska

■ **Art Director/DTP:** Danuta Sawicka

■ **MARKETING & SALES** ■

(advertising, exhibitions & conferences)

■ **Managing Director:** Przemysław Opłocki • po@baltic-press.com

■ **Marketing & Communications Intern:** Ewelina Synak • ewelina@baltic-press.com